American Aviation

JUNE 20, 1955

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Transistors Fly on the F11F

r Grumman F11F Tiger represents a significant dvance in carrier-borne fighters—for a number of rtant reasons.

ot the least of these are her low drag characteristics he result of a wasp-waisted fuselage and high den- design.

mportant, too, is a new instrumentation feature, her oneywell Transistor Fuel Measurement System—first nsistorized *production-line* device to fly.

The new Transistor Fuel Gage has all the accuracy of he famous Honeywell electron-tube gage, but is ighter, smaller, and requires less than half the power. t has been flight tested extensively on many commer- ial and military aircraft.

Transistors have an exceptionally long life, and are extremely resistant to shock and vibration. Unlike elec- tron tubes, they needn't be accessible for easy change. In the new gage they are sealed within the indicator it- self—hermetically protected from dust and accidents.

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Electronic Fuel Measurement Systems for aircraft and missiles —including the new transistorized version — represent only one group of the many Honeywell products in our line of controls for every- thing that flies. We expect the list to grow longer in future years—because automatic controls are so im- portant to aviation progress. And *automatic control* is Honeywell's business.

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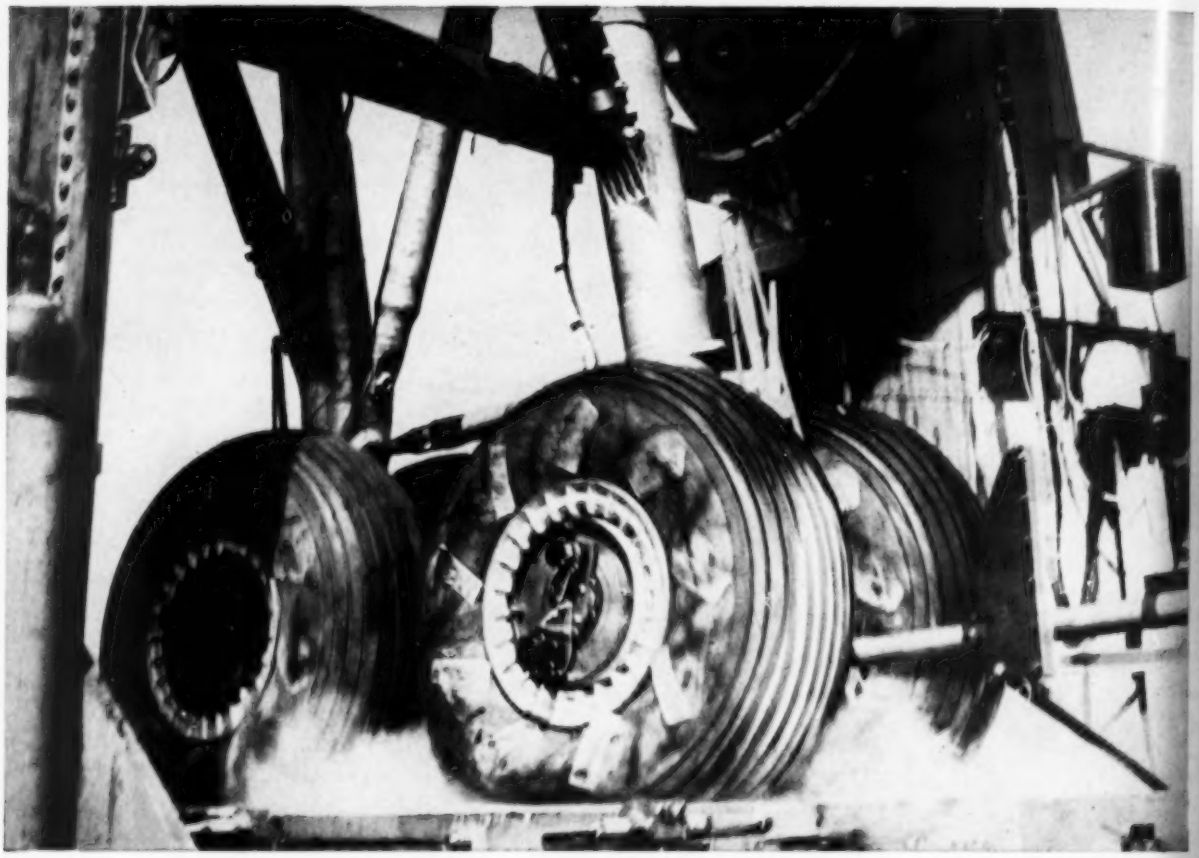

On *TWA's* **SUPER-G** Lockheed Constellation's landing gear . . .

Elastic Stop® nuts pass this brutal drop test

Like a bladeless guillotine, this 40-foot-high Lockheed test stand hoists landing gear assemblies aloft, spins their wheels backward 100 miles an hour, and crashes them down on its concrete base. Tons of lead weights simulate the big plane the landing gear is designed to carry.

The Lockheed experiments are directed toward development of lighter, stronger landing gear. These new units in turn demand fasteners designed for maximum resistance to fatigue failure plus the utmost dependability in terms of rated tensile performance and resistance to loosening under severe vibration and extreme shock and impact loads. Among the planes to benefit from data already secured by these punishing tests is the new Lockheed Super G Constellation, already placed in service by TWA. The Super G Connie's landing gear is only one of the many structural sections of the new plane fastened with vibration-proof Elastic Stop nuts.

Elastic Stop nuts with their familiar red locking collars have been used on every new air frame developed during the last two decades. They have performed satisfactorily under the most unpredictable test conditions . . . under normal operating conditions . . . and throughout millions of hours of rugged combat service. You can rely on flight-tested Elastic Stop nuts!

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Red *Nylon* locking collars are standard on all ESNA fixed fasteners guaranteeing:

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"They've designed the guesswork right out of this fuel pump."

(The fuel systems engineer meant Hydro-Aire's new HY-V/L* pump: the only pump with Design Predictability.)

"I knew the people at Hydro-Aire had developed a new fuel booster pump; and I'd heard about the fact that it's more efficient because it doesn't need the old vapor separator.

"But when they talked about Design Predictability I didn't get it...at first. So they asked us to call a meeting of the whole group...and in less than forty-five minutes they briefed us on an entirely new method of determining pump specifications. Takes all the old "guesstimating" out of writing a set of pump specs!"

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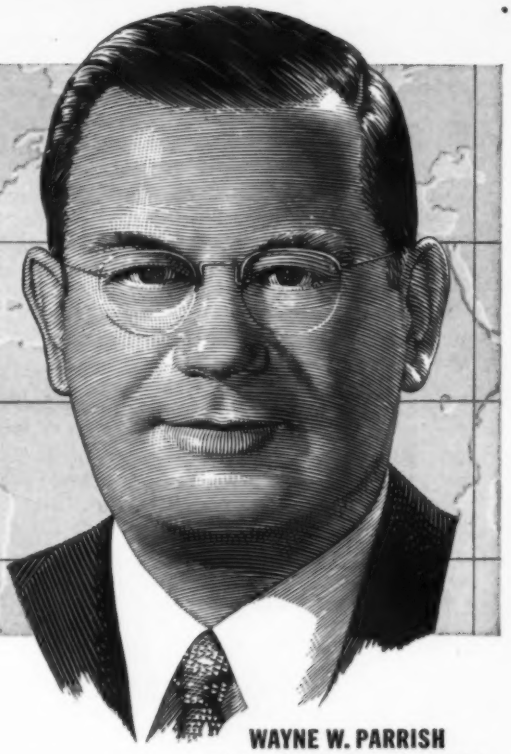

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distinguished editor and publisher of the authoritative American Aviation Publications

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If any man is thoroughly qualified to judge airline service, it's Wayne W. Parrish. He has flown more than 788,000 miles on 70 of the world's scheduled airlines. He has visited 533 airports... flown every type of aircraft... sampled every kind of service. Here's what he says about Western:

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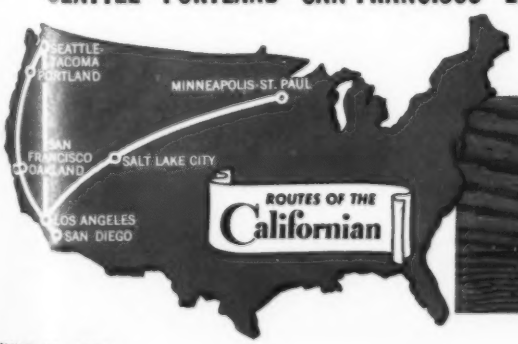


WESTERN AIRLINES

Industry News Digest

AF Asks $416-Million Budget Increase

Air Force has asked Congress for $356 million in additional aircraft procurement funds and an added $60 million for increased research and development under its fiscal 1956 program.

Request was submitted to Senate Appropriations Defense subcommittee by Defense Secretary Charles E. Wilson and AF Chief of Staff Gen. Nathan F. Twining. Both Democratic and Republican members of the subcommittee indicated they felt certain the supplemental request would meet with approval of the full Appropriations Committee.

New money, subcommittee chairman Sen. Dennis Chavez (D-N. Mex.) said, would go for production of both fighters and bombers. It was indicated earlier that funds would only support cost of a stepped-up B-52 bomber program.

If new request is approved, Air Force 1956 procurement budget would go to $6.3 billion. Of the $356 million asked, only $206 million is new money with $156 million representing funds cut by the House of Representatives earlier this year.

de Havilland Alters Comet 4 Performance

New estimates of Comet 4 jet transport performance have been released by de Havilland Aircraft Co., Ltd. based on flight trials with Mark 3 prototypes.

Most significant changes from data released earlier are an increase in gross weight from 150,000 to 152,500 pounds and in fuel capacity from 8,400 to 10,500 gallons. Maximum landing weight is 113,000 pounds and empty operating weight is 68,000 pounds.

Payload for the Comet 4 is now pegged at 16,850 pounds (58-passengers) for 2,870 miles against a 50 mph headwind with full allowance for 30-minute holding and 200-mile diversion to an alternate.

Boyd and Guderley Win IAS Awards

Maj. Gen. Albert Boyd, commander of Wright Air Development Center and Dr. Gottfried Guderley, also of WADC have been named recipients of two 1955 awards by the Institute of the Aeronautical Sciences.

Gen. Boyd will receive *The Octave Chanute Award* for contributions in improved flight testing techniques, facilities development, and aircraft evaluation work.

The Thurman H. Bane Award goes to Dr. Guderley for work in transonic aerodynamics essential to the design of supersonic aircraft.

PRESIDENTIAL AERO COMMANDER made business flying history when Mr. Eisenhower became the first President to fly in anything smaller than a four-engine transport. Highly enthusiastic after his first flight to Gettysburg, the President announced that he would be using his new plane for short haul flights whenever possible. The plane reportedly was loaned to the Air Force by Aero Design and Engineering Co., pending delivery in July of the first of 15 ordered "off-the-shelf." Aero Design announced it would step up production to meet the Air Force contract so as not to interfere with civilian deliveries. The Air Force purchase of 15, according to one source, is just an initial order. Shown with the President is his pilot Lt. Col. William Draper.

Lee Moore Resigns As ACC Secretary

Lee Moore, executive secretary of the Air Coordinating Committee since January 1954, has resigned effective July 31. In a letter to ACC chairman Louis S. Rothschild, Moore indicated he is stepping out so Rothschild can nominate a man of his own choosing for the post.

Senate Committee Boosts CAB Budget

Senate Appropriations Committee has voted to restore $15 million to CAB's budget for airline subsidy payments leaving the total still $8 million short of the Board's fiscal 1956 estimate.

As the bill went to the Senate floor last week, CAB request of $4,125,000 for salaries and expenses had been fully restored. Appropriation for subsidy payments, however, stood at $57 million instead of the $63 million asked by the Board.

Safety Council Awards 39 U. S. Airlines

National Safety Council has named 39 U. S. airlines winners of aviation safety awards for completing the year 1954 without a passenger or crew fatality. Included were 14 trunk carriers, 10 territorial lines, 14 feeder airlines and one cruise operator.

Highest total passenger miles flown without fatality as of December 31, 1954 was Trans World Airlines. In four years of safe operation, TWA accumulated a total of 11,342,484,000 passenger miles.

Longest period of fatality-free service goes to Hawaiian Airlines. In 25 years of operation HAL has flown 507,919,000 passenger miles without a fatality.

CAB Suggests New Crew Time Limits

Civil Aeronautics Board has proposed a new sliding-scale arrangement under which daily crew flight time limits in domestic airline operations would be altered. Flight duty of 10 hours would be allowed if total on-duty time does not exceed 11 hours, and if

on-duty time falls between 14 and 16 hours, maximum flying duty would be set at six hours.

To safeguard against repeated violation of the new limits, CAB also proposes that no operations affecting these time limits may be scheduled unless they can be met with at least 65% regularity during any 90-day period. Deadline for industry comment on the proposal is August 15.

CAA Budget Set at $161.9 Million

Although CAA's fiscal 1956 budget request of $159.3 million came through House and Senate appropriations committees with a $2.6-million increase to $161,915,000, proposed $23-million expenditure for new air navigation facilities has been cut to only $16 million.

More than making up for this reduction, however, its $11-million request for airport aid was hiked by the House to $20 million and approved by the Senate at that amount.

Here's how final CAA budget stood as it went to the Senate last week for approval:

Operation & Regulation ..	$107,125,000
Est. Air Navigation facilities	16,000,000
Airport grants in aid	20,000,000
Washington National Airport	1,415,000
Alaskan Airports	750,000
Air Navigation Development	1,600,000
Other Categories	15,025,000
Total	$161,915,000

UNITED STATES OF AMERICA
DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION
WASHINGTON

Aircraft
TYPE CERTIFICATE No. 814
(Import)

This certificate, issued to Vickers-Armstrongs (Limited) (Aircraft division), Weybridge, Surrey, England

certifies that the following is of proper design, material, specifications, construction, and performance for safe operation [illegible] minimum standards, rules, and regulations prescribed by the

Viscount Model 744

This certificate is not transferable and shall [illegible] surrendered, or revoked.

Date June 13, 1955

By direction of the Administrator:

Signature: F. B. Lee

(Title) Administrator of Civil Aeronautics

This certificate may be transferred if endorsed as provided on the back hereof.

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

FORMAL CERTIFICATION of the Vickers Viscount turboprop transport for airline use in the U. S. took place in London on June 13. Documents covering approval of the aircraft, engine and propellers were presented by CAA Administrator Fred B. Lee to Viscount Knollys, Vickers vice chairman; Air Marshal Sir Colin Weedon, Rolls-Royce; and Sir John Evetts of Rotol, Ltd.

Lockheed Reports $4.5-Million Profit

Lockheed Aircraft Corp. reports net earnings of $4,596,058 on sales and services totaling $190,452,825 for the first quarter of 1955. Corresponding 1954 figures were $4,807,505 and $215,574,304.

Commercial sales represented 22% of total business for the three months, highest percentage since 1950. Total Lockheed backlog in early April was $1,085,401,000 of which 84½% was in military orders.

Beech Demonstrates Twin-jet Four-placer

Beech Aircraft Corp. demonstrated the Morane-Saulnier four-place twin-jet 760 in New York last week and is expected to follow through with demonstrations in Washington, D. C. this week and the next.

Jean Clquet, French pilot, and Beech's Allen Raines flew the plane for press representatives at Westchester County Airport.

Serge Saulnier, member of the board of the French company that designed the plane, and Jack Gaty, Beech vp and general manager, briefed the press on potentials of the plane in the business flying and military fields. Beech will build the plane under license if orders are forthcoming.

Fiat to Build J47

License has been granted by General Electric Co. to Fiat in Italy to manufacture, build spares and overhaul two models of its J47 jet engine. The agreement, which carries U.S. Air Force and State Department sanction, will permit Fiat to supply equipment and maintenance for J47-powered F-86D and F aircraft used by NATO air forces. Deal represents the first licensing of a U.S. jet engine for manufacture in Europe.

C. R. Smith, Gross To Visit Rolls-Royce

C. R. Smith, president of American Airlines, and Robert E. Gross, president of Lockheed Aircraft Corp., will visit Great Britain shortly after July 4 to look over the Rolls-Royce RB 109 turboprop engine for possible use in the Lockheed 310 Electra (see p. 21).

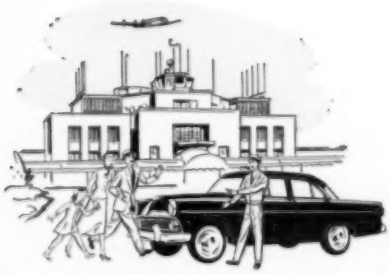
While Lockheed designed the plane around the Allison 501-D10 (commercial version of the T56), AA left the powerplant selection open until a comparison could be made with the RB 109. Odds are that the Allison will be selected.

Meanwhile, a Lockheed turboprop order was expected from Eastern Airlines soon after a meeting of EAL directors last Friday.

AMPHIBIOUS CESSNA. Deliveries are scheduled to start this month on the new Model 289 Edo float which converts the Cessna 180 into an amphibious aircraft. The float design consists of two main wheels just aft of the step which retract into wheel wells within the float for water landings. Two smaller Scott wheels are installed at the bows of the floats and are full-swiveling and retract upward for water landings. An electro-mechanical actuating system retracts the gear.

The modern, attractive Hertz counter above, located at the Memphis, Tenn., Municipal Airport, is Hertz' latest addition to its long list of airport rent a car offices. This new office, like other new Hertz airport offices being installed all over the world, is helping to bring you new passenger revenue. And here's how it's being done!

Hertz opens new office at the MEMPHIS, TENN. Municipal Airport



Hertz, already at most major airports everywhere, expands again to bring airlines NEW PASSENGER REVENUE.

Hertz originated the Plane-Auto Travel Plan. Because of it, many travelers no longer drive from city to city just to have their car at their destination. Instead, they fly in speed and comfort—rent a Hertz car on arrival. And they're assured of a clean, new Hertz car wherever they go because Hertz serves them at more airports and more cities than any other rent a car system. In fact, there are nearly 900 Hertz offices in over 550 cities throughout the United States and most foreign countries.

To tell your passengers of the Plane-Auto Travel Plan, Hertz spends over $1,000,000 a year for advertisements in national magazines. No other company spends nearly as much to promote the Plan. Neither can any other company offer your passengers 10,700 clean, new cars . . . and more than 30 years' experience in courteous rent a car service.

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Promote the Hertz Plane-Auto Travel Plan in all your advertising, displays, folders and any other advertising and promotional programs. And best of all: *urge your ticket sellers and reservation clerks to ask your passengers this simple question:* **"May I reserve a Hertz car for you at your destination?"**

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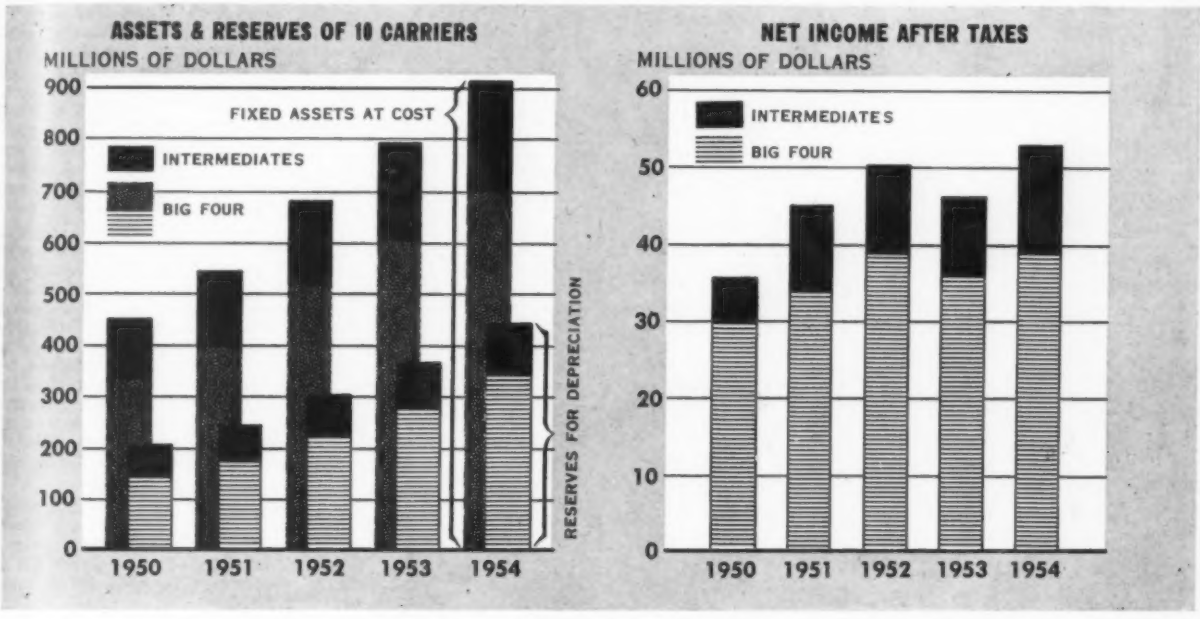
Pulse of the Industry



Profits, Fixed Assets and Depreciation Reserves

Examination of the annual reports of 10 major airlines over a five-year period (1950-1954) shows that the intermediate carriers—Braniff, Capital, Delta-C&S, National, Northwest, Western—are beginning to creep up on the Big 4 (American, Eastern, Trans World and United) in the never ending marathon to determine who has the most money left after taxes.

In 1950, these carriers reported net incomes after taxes of $35.49 million. The Big 4's net income after taxes was $29.92 million, or 84.3%; in 1951, it was 74.6%; 1952, 78.5%; 1953, 73.2%; 1954, 71.8%.

For the five-year period, total net income after taxes for the 10 major carriers was $233.3 million (Big 4, $177.3, 76%; intermediate $56.0 million, 24%).

Big 4 Build Reserves

While the Intermediates experienced a gain in percentage of net income after taxes during this period, the Big 4 was busy building up its reserves and fixed assets—including flight equipment, land and buildings, operating and service equipment, etc.

For 1950, the total fixed assets at cost of the 10 carriers came to $461.9 million. The Big 4's fixed assets at cost were $333.5 million (72.2%). By 1954, they had increased their fixed assets to $701.1 million. In 1954 United became the first airline to have fixed assets (at cost) of more than $200 million.

Since the Big 4 was in possession of more than 70% of the fixed assets, it follows that they would have more money in depreciation reserves. In fact, the Big 4's reserves for depreciation were growing in almost the same proportion as their fixed assets.

Air transportation is a growth industry. The next five years should bring net income after taxes for these 10 firms of more than $60 million, with fixed assets at cost climbing above the $1.3-billion level.

Net Income After Taxes

In Terms of Percent

Carrier	5 Year Average	1954	1953	1952	1951	1950
American	25.0	21.3	27.7	24.9	23.1	29.3
United	19.0	18.0	18.7	21.3	18.8	18.1
Trans World	16.5	19.3	10.5	15.3	16.8	22.1
Eastern	15.5	13.3	16.4	17.0	15.9	14.8
National	5.9	8.3	8.3	4.1	5.7	1.6
Delta-C&S	5.5	2.4	8.6	6.0	6.1	4.7
Northwest	3.5	4.5	4.0	3.6	3.9	0.7
Capital	3.3	3.3	3.4	2.8	3.9	3.3
Braniff	3.2	6.9	*	2.6	2.8	3.3
Western	2.6	2.7	2.4	2.4	3.0	2.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

* *Less than 1/10 of 1%.*

Circle No. 3 on Reader Service Card.

Books

The Lonely Sky. *By William Bridgeman with Jacqueline Hazard. Published by Henry Holt and Co., New York. 316 pp. Price: $3.95.*

The jacket blurb on this one, which says it is a story "that will earn its rightful place in the literature of aviation," is not excessive. Whether it was written by Bill Bridgeman or his collaborator, the end result is the same. It's a masterfully told story of a World War II veteran who joined Douglas Aircraft as an engineering test pilot and was given Navy's javelin-shaped D-558-II Skyrocket experimental plane to take through the sound barrier.

The step-by-step account of how Bridgeman lived with the Skyrocket for two years and finally became its master reads something like a Jules Verne book, attuned to the tempo of the jet age. It is fast moving from start to finish, with Bridgeman emerging as a completely honest explorer into the unknown, a man who likes the grim game of being alternately thrilled and frightened as he flirts with death in the relentless pursuit of scientific and technical knowledge to help men fly faster, higher and better.

On August 15, 1951, the Skyrocket, with Bridgeman at the controls, shattered all existing altitude records when it exceeded the official 72,394-ft. mark established in 1935 by a man-carrying balloon.

Exact altitude reached by the supersonic plane was not revealed. All Navy would say, apart from the fact that the record had been broken, was that "this latest flight by Bridgeman successfully concludes the first phase of a research and development program three years old." The plane was turned over to the National Advisory Committee on Aeronautics for the next phase.

The book is a fine addition to aviation literature, and Bridgeman is a most engaging hero. . . . B. B.

Coordination, Control and Financing of Industrial Research.

Edited by Albert H. Rubenstein. Proceedings of the fifth annual Conference on Industrial Research, June, 1954: with selected papers from the fourth conference, June, 1953. Published by King's Crown Press, Columbia University, New York. 420 pp.

Full texts of important papers delivered by leading experts in various phases of industrial research at the past two conferences sponsored by the Department of Industrial Engineering of Columbia University are included in this book. Executives of large and small corporations that carry on research activities and educators of leading university schools of business administration give their views on problems of policy and planning at various levels of management.

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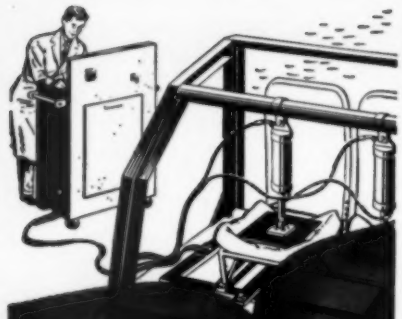

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Production Spotlight

• Beech Aircraft Corp. will demonstrate the Morane-Saulnier 760 twin-jet four-seater to Army, Navy and presumably Air Force at Washington National Airport June 22.

• Because of changes in the titanium program, Office of Defense Mobilization is expected to release some of the nickel it has been stockpiling. Original program called for greater use of titanium as a replacement for nickel in jet engine production.

• Look for early certification of the Doman-Fleet LZ-5 helicopter.

• Reports from Canada indicate the "flying saucer" fighter project of Avro-Canada will be abandoned soon. Cost of development of the project had been set at about $75 million.

• No decision is in sight on production replacement of North American Aviation-licensed F-86 production at Canadair. These have been discussed as possibilities: Convair F-102, Lockheed F-104 and NAA F-100.

• Avro-Canada's supersonic delta CF-105 interceptor will incorporate many features of the British Avro 707 experimental aircraft and the Vulcan bomber. The twin-jet delta will be powered by two Orenda engines with ratings in the 18,000 lb. thrust class. Plane is scheduled for first flight next year.

• Several orders for Vickers Viscounts have been received from U.S. corporations in addition to that of U.S. Steel. Announcements will be forthcoming soon.

• Germany's new air force will have a total of 1,326 planes: 600 fighters; 450 fighter-bombers; 72 all-weather fighters; 108 reconnaissance planes; 96 transports.

• First successful ejection from a supersonic aircraft in the U.S. occurred last February 27 when Bob Smith, North American test pilot, was ejected from an F-100 Super Sabre at a speed of Mach 1.05 and altitude of below 7,000 feet. Ejection mechanism worked satisfactorily although eight panels in the parachute were lost. He landed in Los Angeles Bay and, although still recuperating, has sustained no permanent injuries.

• Progress in utilization of the radio frequency region above 10kmc was demonstrated recently by Raytheon Manufacturing Co.'s recent showing of common carrier relay equipment developing 100 milliwatts in the 12,700 to 13,200 mc band.

• First domestic airline to equip its fleet with X-band radar will be National. Investing $1 million in weather and ground mapping installations, NAL will make first installations in DC-7s, DC-6Bs and DC-6s with Convairs to follow.

LOCKHEED'S TWO HERCULES turboprop troop transport prototypes are shown in recent test flight. High-wing C-130 in background is being tested at 54 tons gross weight, while plane in foreground is undergoing electronics and power checks. Hercules is powered by four Allison T56 turboprops rated at 3,750 shp each.

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Circle No. 6 on Reader Service Card.

Personal View

By WAYNE W. PARRISH

Hemispheric Giveaway?

AT PRESSTIME quite a ruckus had developed in Washington over a new bilateral air agreement between the United States and the newly sovereign West Germany.

The agreement was all ready for signing when its major provisions leaked out and the sparks began to fly. It was immediately described, perhaps justifiably, as "a hemispheric giveaway." The Senate Interstate and Foreign Commerce Committee set a hearing to give U. S. negotiating methods a thorough airing.

It is high time the spotlight was focussed on the entire procedures leading up to the making of air agreements with other countries. The German agreement is only an incident, but a very important one, for it reveals the evils of secrecy and it establishes an unfortunate precedent in route patterns which can lead to an even greater deterioration of our foreign air policy. It throws into glaring perspective the haphazard piece-meal approach we've been making in our air deals with other nations.

Western Germany is now on its own feet. Its economic recovery has been extraordinary. Once more a German airline—Lufthansa—is in existence and no one doubts that it is destined to be one of the important air carriers of the world. No one doubts, either, that Lufthansa will be flying the Atlantic to New York and other U. S. points. In this regard Lufthansa is welcome to join the growing group of international carriers.

But in a rash of generosity which must have swept even the eager Germans off their feet, the U. S. has proposed to give rights to Lufthansa to fly to Boston, New York, Philadelphia, and Chicago; the right to fly a "polar" route to San Francisco; and, most important of all, the right to fly from New York or Philadelphia to "any point" in the Caribbean and beyond to South America. Never has this country, in one single, headlong bountiful rush, dispensed so much in the way of air rights to one country.

Why the rush? The Germans are an ambitious people, but at the moment the Lufthansa fleet is quite small and the Germans have a great deal to learn in today's highly competitive and advanced air world. At the moment the West Germans are unable to guarantee to the U. S. air rights to Berlin, but the U. S. left nothing on our side for future trading.

One can debate for a long time the merits or demerits of the German agreement, but in our view it represents only an example, not the primary issue. The real issue is the piece-meal manner in which the U. S. is tackling foreign air policy. Is a right-angle route from New York to South America a "point beyond" the U. S. from Germany, or does it not establish a precedent which will bring even more foreign carriers into the U. S. market and our own backyard?

While we continue to open our air gates wide to all who wish to partake in the greatest traffic generating center in the world, various countries—notably India, Japan and Brazil—are nipping at our own traffic rights by creating capacity barriers to free and open competition. AMERICAN AVIATION believes in freedom of the air. We believe competition should be the controlling factor. But we believe firmly it is a mistake to open our own gates unless and until there are positive assurances that our own U. S. carriers will be given full and free opportunities to tap the world markets.

The U. S. weakness in international matters is not hard to find. We have no single trained, experienced negotiator who puts each new agreement into an overall national policy, such as able Sir George Cribbett for Great Britain. Instead a CAB member or whoever is quickly available is suddenly thrust into the position of negotiator and in most instances the representatives on the U. S. side are inexpert in international affairs.

We hope the German agreement provides a sufficient jolt to the CAB and the State Department to raise the stature of our negotiations and to obtain an over-all policy. The trend is against us. Unless the trend is checked, our air position internationally will deteriorate under the double blast of open gates at home and artificial capacity barriers overseas.

Jets - At Last

AMERICAN AIRLINES' decision to order the Lockheed Electra turboprop transport clears the air for the future direction of the U. S. commercial jet age. It now seems clear that Lockheed will concentrate on the turboprop field, which should become very important, and Douglas will concentrate on the DC-8 turbojet, also a highly important market. This division of major markets by the two Southern California manufacturers seems to be a welcome and wise outcome of some years of confusion, but the position of Boeing with its 707 turbojet remains unclear. It would seem that Boeing will be competing directly with Douglas for the all-jet market, but so far the Air Force has been holding back in giving Boeing a go-ahead to utilize (with compensation) the tooling and plant facilities necessary for commercial output. Now that the Lockheed and Douglas plans are firmed up, it would appear that the USAF should clarify its position with regard to Boeing, which, with considerable commendable initiative, developed the 707 prototype now being tested. In any event the U. S. role in the jet age has moved forward substantially by American's turboprop decision.

Every Five Seconds . . . .

JUST ABOUT the finest brochure on air progress we've ever seen has just been published jointly by the International Air Transport Association and the International Civil Aviation Organization, both in Montreal. Called "every five seconds . . .," it is the story of ten years of postwar international civil aviation and could scarcely be improved upon. Credit for the project goes to Ralph Cohen, public relations officer of IATA, and to Leon Boussard of ICAO. Copies may be obtained by writing to IATA, International Aviation Building, Montreal 3, Canada.

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When & Where

June 20-23—Institute of the Aeronautical Sciences and Royal Aeronautical Society joint meeting, Los Angeles.

June 21—Air Transport Association board of directors meeting, Washington, D. C.

June 23-25—Institute of Navigation annual meeting, Maxwell AFB, Alabama.

July 2-6—Ninth annual All-Women's Transcontinental Air Race, Long Beach, Calif. to Springfield, Mass.

July 8-10—Second annual Pikes Peak National Air Convention, Colorado Springs, Colo.

Aug. 5-7—Third annual "Fly-In," Experimental Aircraft Association, Curtiss-Wright Airport, Milwaukee.

Aug. 8-10—Second National Turbine-Powered Air Transportation Meeting (sponsored by the Institute of the Aeronautical Sciences), Seattle.

Aug. 10-14—Air Force Assn. Convention and Airpower Panorama, San Francisco.

Aug. 15-20—National Flying Farmers' Association convention, East Lansing, Mich.

Aug. 19-21—Second annual "Fly-In," Antique Airplane Association, Ottumwa, Ia.

Aug. 22-23—Symposium on Electronics & Automatic Production. Stanford Research Inst., San Francisco.

Aug. 24-26—1955 Ignition Conference sponsored by Scintilla Div., Bendix Aviation Corp., Sidney, N. Y.

Aug. 24-26—Western Electronic Show and Convention, San Francisco.

Sept. 3-5—National Aircraft Show, sponsored by Air Foundations, Philadelphia International Airport.

Sept. 8—Airwork engine forum, sponsored by Pratt & Whitney and Bendix, Millville, N. J.

Sept. 15—Airwork engine forum, sponsored by Pratt & Whitney and Bendix, Miami, Fla.

Sept. 26-27—Automation Symposium, sponsored by Radio-Electronics-Television-Manufacturer's Assoc., University of Pennsylvania, Philadelphia.

Oct. 4-6—11th Annual Spark Plug & Ignition Conference sponsored by Champion Spark Plug Co., Toledo.

Oct. 5-7—National Airports Conference (sponsored by American Association of Airport Executives and the University of Oklahoma, with Civil Aeronautics Administration cooperation), Norman, Okla.

Oct. 5-7—National Business Aircraft Association annual meeting and forum, Sheraton-Cadillac Hotel, Detroit.

Oct. 11-13—Air Transportation Association engineering and maintenance conference, Dallas.

Oct. 11-15—Nat'l Assn. of State Aviation Officials annual meeting, Dallas.

Oct. 11-15—Society of Automotive Engineers aeronautic meeting, aircraft production forum and engineers forum, Los Angeles.

Oct. 31-Nov. 1—East Coast Conference on Aeronautical and Navigational Electronics, sponsored by I.R.E., Baltimore, Maryland.

INTERNATIONAL

July 27-29—Helicopter Congress, Rotterdam Helicopter Syndicate, Rotterdam.

Aug. 30—International Civil Aviation Organization air navigation conference, Montreal.

Sept. 6—International Civil Aviation Organization conference on draft protocol to amend Warsaw convention, The Hague.

Sept. 6-11—Society of British Aircraft Constructors Aircraft Show & Flying Display, Farnborough, England.

Nov. 1—Pacific regional air navigation meeting of the International Civil Aviation Organization, Manila.

Nov. 3-4—Joint meeting of the Institute of the Aeronautical Sciences and the Canadian Aeronautical Institute, Ontario.

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Beechcrafts have helped thousands of expanding businesses meet the challenge of competition and of growth. Cruising at 200 miles per hour, with a range up to 1100 miles, the Beechcraft Twin-Bonanza flies *faster* and flies *farther* than any other plane in the six-place class! Hundreds of business-owned Twin-Bonanzas prove — The World Is Small When You Fly A BEECHCRAFT.

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Beech Aircraft Corporation, Wichita, Kansas, U. S. A.

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

DESPITE RECENT INDICATIONS TO THE CONTRARY, Air Secretary Harold E. Talbott says the USAF is now and must continue to be the most powerful force in existence. Air Force is ahead, Talbott says, in seven basic elements that go into military power.

Numbers of men—USAF's total strength of over 950,000 makes it the largest national air force in the world—bar none.

Combat Materials—No other air force has a greater amount of effective combat materials, including atomic weapons of all types and varieties.

Training—USAF's state of training and combat competence is unequalled.

Modernization—There is no air force more modern in total than ours.

Deployment—No other air force remotely approaches our advantage in strategic deployment at operational bases around the globe.

Mobilization Potential—Skills created in building and operating 303,000 war planes during 1940-1945 remain as a mobilization potential without peer. In contrast, Russia has never employed strategic bombers in war.

Morale—USAF is an elite corps of competent fighting men with a self-confidence justified by their own peerless performance in hot and cold wars.

HOUSE ARMED SERVICES COMMITTEE has approved Air Force's controversial proposal to move the Air Research and Development Command from Baltimore, Md., to Wright-Patterson AFB, Dayton, Ohio, by authorization expenditure of $6 million for headquarters facilities.

SCIENTISTS AND TECHNICIANS engaged in key defense activities may be granted special handling under the Selective Service Act, according to a plan now being considered by Selective Service director Lewis B. Hershey. Program would provide that personnel in this category be returned to their jobs or training after six months of basic military training.

RAPID STRIDES IN THE DEVELOPMENT of reactors for atomic propulsion of military aircraft have led to a "major breakthrough," according to Atomic Energy Commission chairman Lewis L. Strauss. He told recent House Appropriations subcommittee hearings that developments during the past year warrant a sharp intensification and expansion of aircraft nuclear propulsion efforts. Developments reportedly involve "a new approach to the problem."

AEC request for fiscal 1956 aircraft reactor program comes to $37.9 million compared with $21,575,000 in 1955 and $14,572,118 in 1954. Higher budget is to provide increased emphasis on R&D, fabrication of major experiments, and start of operation of ground test facilities at the National Reactor Testing Station in Idaho.

PENTAGON MAY ALTER ITS POLICY of permitting production line photos of new aircraft as the result of cutaway drawing of the F-100A Super Sabre in the Japanese magazine *Aireview*. AMERICAN AVIATION Magazines' reproduction of the picture (June 6), with delicate points of information deleted, caused a furore. Major wire services and the news magazines *Time* and *Newsweek* used the story to point out that similar data is not available in the U. S.

Aireview said available photos and information made it possible to make the cutaway drawing. Another magazine, Britain's *Flight*, published a similar picture later, said it deduced information from unclassified photographs.

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Grumman F9F-9 Tiger

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Northrop Scorpion

Inflatable rubber band gives fighters more stretch

SEVERAL YEARS AGO, canopy seal blowout trouble sometimes hampered fighters at high altitudes. The effect of high pressure inside the canopy and low pressure outside could "pop" the inflatable seal between the canopy and fuselage. It had to stretch so much to make an air-tight seal, it couldn't stand the strain. When that happened, the pilot had to get down fast.

B. F. Goodrich engineers believed the way to stretch a fighter's altitude was to develop an inflatable band of rubber that would seal under low pressure without strain. They made a rubberized diaphragm that rests inside a solid rubber base. Inflated, the diaphragm simply lifts a "sealing bead" against the canopy to make an air-tight seal. It works like blowing up a paper bag. Dangerous stretching (like blowing up a balloon) is eliminated. Result? Canopy seal blowout trouble is now a thing of the past.

This seal inflates almost instantly. And even at minus 65° it inflates with less pressure than old-type seals needed at room temperature. Also, it resists wear and damage better. Fits curves better. Seals and unseals faster. Minimizes sliding wear and scuffing because it gives greater clearance when deflated.

The B. F. Goodrich inflatable seal is used on more than a dozen of our hottest fighters including those shown above. Other products of B. F. Goodrich research and engineering include: tires, wheels and brakes, De-Icers, heated rubber, Pressure Sealing Zippers, Avtrim, fuel and oil cells, hose and other accessories. *The B. F. Goodrich Company, Aeronautical Sales, Akron, Ohio.*

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ESTABLISHED JUNE 1, 1937

American Aviation

VOL. 19, NO. 2

Jets or Turboprops? Airlines Face Big Decision

- **Orders must be placed within next few months**
- **American signs $65-million order for 35 Lockheed 310s**

By ROBERT LOEBELSON

TOP EXECUTIVES of the world's major airlines last week were faced with a decision they had postponed as long as possible. They not only had to choose between turboprop and turbojet transports, but also were compelled to place their orders within the next few months or lose ground competitively.

The stimulant came in the form of two announcements within 24 hours of each other:

• **American Airlines** signed a $65-million order with Lockheed Aircraft Corp. for 35 turboprop transports.

• **Douglas Aircraft Co.**, which lost out to Lockheed in the AA turboprop competition, announced it would go ahead with construction of the DC-8 turbojet.

Certain to follow AA with orders in the very near future were two other carriers included in the so-called Big Four—Eastern Air Lines and United Air Lines.

• **EAL** board chairman E. V. Rickenbacker has indicated Eastern wants at least 100 turboprops delivered by 1960 that are capable of flying 425-450 mph at ranges up to 2,500 miles. He says Eastern expects to pay $250 million for the planes, plus an additional $50 million for facilities and equipment to handle the turboprops. EAL's requirement, however, is beyond the capabilities of the Lockheed Electra ordered by American.

• **UAL** president W. A. Patterson has said United's next long-range transport will be a turbojet and that the order will be placed within the next 12 months. United traditionally has been a Douglas customer, so no one will be surprised if it places an order for DC-8s.

The other member of the Big Four, Trans World Airlines, had tried to buy a turboprop-powered version of the Lockheed Super Constellation, the Model 1549, three months ago, but the Pratt & Whitney T34 engine could not meet the required performance specifications in time. As a result, TWA placed a $70-million order for 24 Model 1649s, using Turbo Compound piston engines, in April. The L-1649 can be fitted with turboprops when they become available.

Meanwhile, a report was heard that Howard Hughes, principal TWA stockholder, had started discussing a jet transport with Convair Division of General Dynamics Corp. However, J. G. Zevely, Convair's director of sales and contracts, who admitted that his firm is interested in developing a jet transport for either commercial or military use, said no discussions have taken place. "We would be delighted to have the opportunity to talk about such an airplane with Mr. Hughes, but the rumor that discussions have already started is without foundation."

• **The American order** for a turboprop was the result of a competition in which Convair, Douglas, Lockheed and Vickers participated (AMERICAN AVIATION, Jan. 31). When the range requirement was increased from 750 to 2,000 miles, only the Douglas and Lockheed entries remained. In ordering the Lockheed model, American (also a traditional Douglas buyer) gave the Burbank company its first AA order since the early 1930s when Lockheed Orions were used in mail service by what was then American Airways.

AA's anouncement of the order did not say that the engines used on the Electra would be the 3,750 hp. Allison 501 (T56s) used in Lockheed's design proposal. It was explained that the new plane is designed to use engines as high as 5,000 hp (possibly the Rolls-Royce RB-109) with few modifications.

Features of the Electra include "built-in" loading steps (consequently eliminating the need for "roll-up" loading ramps), provisions either to check or carry luggage aboard, an interior "several inches wider" than any transport now flying and resultant wider seats, and each seat will have its own table for eating or writing.

• **New soundproofing** techniques will reduce noise in the cabin and sightseeing windows (20 by 16 inches) will give passengers improved visibility. Weather avoidance radar and autopilots will be standard equipment. AA also says the reversing propellers will permit the Electra to operate from airports having 5,000-ft. runways without difficulty.

The DC-8, which may also be ordered by American, will be ready for

Lockheed Electra Specs

Design and performance data on the new Lockheed CL-310 Electra, 35 of which are to be delivered to American Airlines between the end of 1958 and mid-1959, include:

Gross Weight	98,500 pounds
Cruising speed	Over 400 mph
Range	2000 miles
Seating capacity	64 plus 6 in lounge
Fuel capacity	4178 gallons
Cargo space	400 cu. ft. excl. of baggage space
Cargo capacity	4000 pounds
Cruising altitude	Up to 30,000 ft.
Powerplants	Undecided—design based on Allison T56
Length	101 ft. 4 in.
Wingspan	95 ft.
Overall height	34 ft.
Crew	5 (2 pilots, flight engineer, and 2 stewardesses)

LOCKHEED TURBOPROP was ordered in quantity by American Airlines shortly before . . .

DOUGLAS AIRCRAFT CO. announced it would go ahead with its DC-8 four-jet transport.

its first flight tests by December 1957, Douglas says, and airline deliveries will start in 1959.

The Santa Monica company made no reference to a prototype in announcing the go-ahead signal from the board of directors after a special meeting, indicating that Douglas will follow its usual procedure of starting with a production model. Full certification, according to estimates, could be completed by late summer 1959, and Douglas will probably have 12 or 15 ready for delivery at that time. No price was mentioned for the DC-8 but a figure of $4.5 million is said to be very close.

• **Douglas** has been working up the DC-8 for more than three years and the company's total investment to date, including the cost of preparing for the USAF's jet tanker competition, is placed at "several million dollars."

There are now at least three aircraft companies in the world with long-range jet transports beyond the paper stage:

• de Havilland in Britain with its Comet IV.

• Boeing at Seattle with its Model 707.

• Douglas at Santa Monica with the DC-8.

The British firm is struggling to retrieve its reputation, seriously damaged after a number of accidents to earlier Comets last year, and orders for the Comet IV (except from British Overseas Airways Corp.) have been slow coming in.

Boeing is hampered by its military commitments on the KC-135 jet tanker and is having difficulty in getting auth-

'orization for a commercial version of the advanced 707.

Douglas has no obligation to USAF, and therefore appears to be in a position to deliver the DC-8 first.

• **Like the Boeing** KC-135, the DC-8 uses four advanced Pratt & Whitney J57 turbojets mounted in pods. These engines, Douglas says, will give the DC-8 a cruising speed of 550 mph. The plane will carry between 80 and 125 passengers.

Overseas version of the DC-8 will have a maximum gross weight of 257,000 pounds, the domestic model 211,000 pounds. The plane will be able to operate from present airports "at costs even lower than current passenger models." Wingspan is given as 134.6 feet, length 140.6 feet, height, 40.2 feet.

Typical flight times of the Douglas jet were given as New York-Paris 6 hours 32 minutes; San Francisco-New York 4 hours 43 minutes; San Francisco-Honolulu 4 hours 23 minutes.

Thus, the long-delayed jet/turboprop era has arrived for U.S. and foreign flag carriers. Britain took the lead with the jet Comet and the turboprop Viscount but the two largest U.S. commercial plane builders have closed the gap. From here on, Burbank and Santa Monica are convinced, the world's airlines will have to start placing their orders.

• • •

Air Force Asks $60 Million More For Research and Development

By FRANCIS J. KEENAN

Growing Congressional concern over apparent inadequacies in military research and development programs—highlighted by vigorous Hoover Commission charges—has resulted in some action.

Air Force took the first step last week when it asked the Senate Appropriations Committee for an additional $60 million for "emergency" research and development programs.

The request was unexpected, coming as it did with the Administration's special request for funds to finance the AF speedup in B-52 production.

And while no "new money" is involved—it includes authority to transfer $50 million from another category into the R & D budget and restoration of a $10 million House emergency fund cut—the move did reflect awareness of growing Soviet airpower and recognition of Congressional doubts about the program.

The Hoover Commission report landed fortuitously in the middle of the Congressional furor roused by the first, cryptic Defense Department reports May 13 of Soviet gains. The Commission study, presumably already prepared, arrived two weeks later. In the meantime, several Senators were voicing complaints about U.S. progress in the development of advanced aircraft and missiles.

Sen. Stuart Symington (D-Mo.) estimated the USSR was ahead in work on the "ultimate" weapon, the Intercontinental Ballistic Missile. Sen. Richard Russell (D-Ga.), chairman of the Armed Services Committee, asserted that Defense R & D programs were "too scattered" but "might be sufficient" if better coordinated.

Sen. Henry M. Jackson (D-Wash.) emphasized qualitative requirements in secret hearings before his Military Applications subcommittee of the Joint Atomic Energy Committee.

Sen. Warren Magnuson (D-Wash.) blasted the Defense Department for its "failure" to recognize the role of R & D in maintaining airpower, which he said was reflected in too little training of scientists and too modest programs in developing new weapons and procedures.

The Hoover Report appears to confirm and elaborate on these charges. It warns that "the Armed Services are not sufficiently daring and imaginative in their approach to radically new weapons and weapon systems." It said even stepped-up R & D programs may be too late to maintain U.S. supremacy in weaponry, while current levels are entirely inadequate.

It maintains that Defense Department organization failed to provide sufficient opportunity for new approaches in weapon development. And it notes that "informal proddings" by civilian scientists and technologists accounted for most advances.

The Commission emphasizes that U.S. defense efforts depend basically on the success of its research programs. Therefore, it recommends these things are needed:

• **Increased integration** of R & D programs.

• **Better personnel** policies designed to keep military and civilian experts on the job.

• **Greatly increased** attention to basic research.

• **More effective** utilization of the nation's scientific and technical communities and private research facilities.

• **An overall strengthening** of the

FIRST PHOTO of Douglas DC-7B, pictured here with earlier standard DC-7, shows new wing saddle tanks fitted on Pan American's aircraft. Official difference between DC-7 and DC-7B is new Wright DA4 Turbo Compound engine. PanAm's DC-7Bs will have the extra-range tanks, but Eastern Air Lines' aircraft will not. PAA's airplane is approved for 126,000 gross takeoff weight, whereas EAL's is approved for 122,200 and Panagra's for 125,000 pounds.

quantity and quality of R & D work.

Among its specific recommendations, the Hoover group asks for a new top-level committee of scientists to advise the Assistant Secretary of Defense (R & D) of the needs and opportunities offered by new scientific knowledge for radically new weapons systems.

It stresses the need for expert R & D Assistant Secretaries for the three services, equipped with trained staffs, devoting themselves exclusively to research and development activities. The report also reminds the Secretary of Defense of his authority to withhold funds from proposed programs as a means of effecting coordination and eliminating unwarranted duplication.

The Commission commended the Air Force on several counts—for its "well-integrated organizational structure," its professionally qualified R & D Assistant Secretary (Trevor Gardner), and its increasingly effective use of civilian research organizations.

Thirteen of its 15 recommendations, the Hoover Commission reminded Congress, could be implemented by executive and administrative action.

Defense Department's reception of these proposals, however, was mixed. Secretary Wilson told reporters he planned "to take the Hoover Committee reports, get a good crew of people here to help me do it, and to process them and implement the ones that are workable and good as rapidly as we can."

Wilson was inclined to think, however, that such reports "take a little poke at us." While he granted the R & D programs could be "shifted around" to some advantage, he felt that to increase the total "very much" would only "bid up the cost of it."

"I don't think it is perhaps a completely fair thing to say we are lagging in basic research," Wilson added, "when half the research of the United States is financed by the Pentagon." He insisted he was "for" research and development, but emphasized that "balance" must always be kept in mind as between all the demands on the military budget.

Throughout the controversy, Congressional spokesmen continued to reiterate that they are ready to provide whatever is needed in the way of money and authority to keep the U.S. on top.

Canadian Says Air Commands Integrated

By ALBERT D. HUGHES

Air Defense Commands of Canada and the United States are now integrated at a practical working level and are headed toward one overall command with a supreme commander, Canada's Chief of Air Staff, Air Marshal C. R. Slemon, told members of the Aviation Writers Association during their visit to Canada's Air Defense Command headquarters, St. Hubert, Que., this month.

Slemon, whose remarks stirred up a small storm in the Ottawa Parliament, and were unofficially denied in the U.S., pointed out that policy, planning and weapons are aimed at a single defense organization with a supreme commander. The decision whether there is an overall head must be a high-level political one by the two nations, he said, adding that because of the practicality of such an arrangement, a supreme commander "will come in due course."

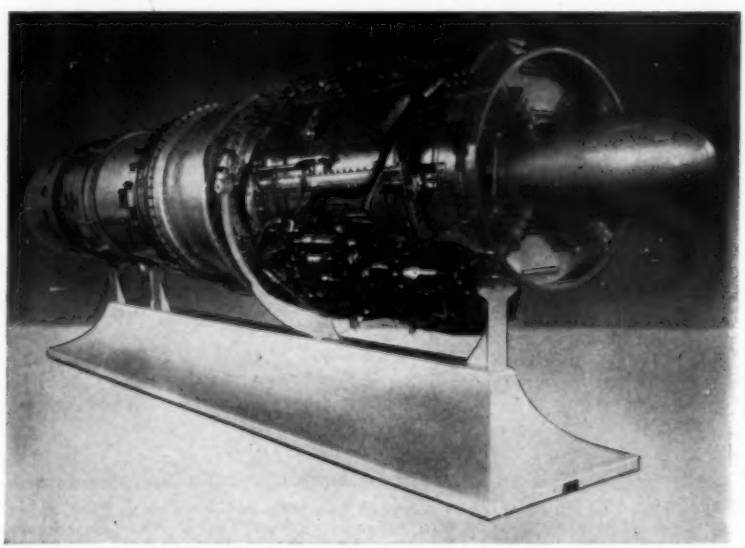
The top air officer of Canada emphasized the "air defense of North America" and said that the problem cannot be divided into the air defense of Canada or the United States. He pointed out that enemy raiders bound for targets in the United States must cross Canadian territory, must be detected and identified over Canada and, thus, the problem is one of joint concern.

Earlier, Canada's Air Vice Marshal L. E. Wray said that "the startling advance of the USSR in the air has drastically changed our position in the western world. We are striving to meet the new challenge." Canada's second air officer declared that the "stark realities" of the ability of Russia's air force had made obligatory the concept of continental air defense.

Canada's part in the air defense plan absorbs 25% of its entire defense budget, Wray said. Canada's defense force, he said, "aims to make Canadian air space so hazardous to an enemy that he will not attempt it." Defense must be made a "major hazard," he emphasized again, in order to protect one of the major deterrents to war—the USAF's Strategic Air Command. "We are building a stronger and stronger defense system to protect the air force of another nation," Wray said.

"It is not enough to have retaliatory capacity—we must have the ability to stop initial enemy strikes," Wray pointed out, adding that this capacity must be provided by the U.S.-Canada defense systems. He also pointed out that the two defense systems do not recognize political borders or, at least, are acting as though borders did not exist. Wray said that if the tide of battle required, Canadian and American fighters and bombers would move freely over each other's territory and would automatically accept commands of the nation over whose territory they chanced to be. He also pointed out that St. Hubert and Colorado Springs are in instant communication with each other by wires and radio and that the plotted radar information is instantly available to each nation.

Group Capt. G. S. Austin, Staff Officer Policy Plans, who is the Canadian officer stationed at USAF's ADC headquarters in Colorado Springs, affirmed that RCAF's long-range air defense planning aims are common with the USAF. Though there are restrictions on the use of national data (more so in the case of the U.S.), the two



AFTERBURNER VERSION of the Curtiss-Wright J65, which powers the Grumman F11F-1 Tiger Navy fighter and the Lockheed XF-104 AF fighter, was displayed for the first time this month at the Paris air show. Thrust rating with afterburner is reported to be more than 10,000 lb.

nations are working on one product, defense, Austin said.

He said the two nations are planning to take a one-year look ahead as well as a 10-year glance at the whole defense plan.

Austin emphasized four significant trends in air defense planning since 1945, end of World War II:

• The range of the vehicle in the hands of the enemy's strategic air force has increased steadily, turning the North American continent into an island and making continental air defense an entity.

• Increases in combat air speeds have increased the depth of the combat zone, hence the depth of the warning zone. Reaction time for detection and identification being the same, twice the depth of warning zone is now required to set the intercepting aircraft or missile on a proper "collision course" with the enemy.

• The "first-class race for height" has had an impact on the radar system: At higher speeds, greater heights and smaller aspect ratios, aircraft present smaller targets on radar identification screens—"a grim but not serious problem."

• The "bomb" itself has had two effects: 1. The fact that only one bomb is needed for one target has reduced bomber need to come back, hence one cannot be content with old defense or old weapons. (2) Victory must be achieved over the bomb and its carrier, giving air defense a vital mission to conclude the battle outside the target area.

Austin pointed out that the effectiveness of the nuclear bomb permits much smaller raids to do damage of critical import. Smaller dispersed raids timed to approach the continent from various directions could get through unless they are detected by the defense systems. Later, in the big plotting room at St. Hubert where an enemy air raid would be tracked from the moment it approached within radar distance of North America, Marshal Wray graphically demonstrated why joint defense is a necessity, should such dispersed raids be launched. This possibility, Wray again emphasized, is why the defense watchers are on 24-hour duty.

The distant early warning (DEW) radar "fence" along the Arctic zone, Austin said, provides a premium in warning time, with interception for identification of initial attackers and a second wave accomplished sooner. Because of the advantage in time, the United States accepted the responsibility for financing the DEW line, Austin said, adding that Phase I of its construction is now completed with operation expected on the planned date.

Construction of the DEW line launched one of the largest airlifts ever undertaken in North America in order to take advantage of the short construction season. Some 1,500 personnel and 2,200 tons of equipment had to be airlifted. The aircraft of 15 commercial Canadian carriers, RCAF and USAF, were employed in the airlift, which at times reached a maximum of 135 aircraft arriving daily. C-124 Globemasters of the USAF airlifted large 40,000-pound earth-moving tractors which were disassembled into four pieces in order to accomplish movement. • • •

Holifield Report Hits TACAN Policies

Final report on the TACAN-VOR/DME investigation by the House Military Operations subcommittee was released last week. Rep. Chet Holifield (D-Calif.), chairman, described TACAN "as an example of the military going into full-scale production on a procurement before the item is reliable."

The subcommittee warns the Department of Defense to "restrict the procurement schedule of TACAN units" and "limit the deliveries of TACAN equipment." "In no case," the report continued, "should the Secretary of the Department of Defense permit further production deliveries in excess of such amount necessary for technical development."

The House subcommittee report differs greatly from recommendations made by the House Commerce Committee in May. The latter group had asked for the speed-up of TACAN and the slowdown of DME. The only similarity between the two reports is the recommendation that TACAN be immediately declassified.

One of the strongest recommendations in the Holifield report calls for the General Accounting Office "to perform a thorough audit of costs incurred on the outstanding contracts and the amount of the Government's obligation under existing TACAN contracts." Further, it is recommended that GAO "in cooperation with the Bureau of the Budget submit an estimate to Congress by December 31, 1955 of the projected ultimate cost of the TACAN military program based on the latest financial data available at that time."

Another recommendation calls for the Secretary of Defense to provide a report to the Government Operations Committee "which would show cause why the current procurement order should not be readvertised for the purpose of achieving greater competition and a possible reduction in costs."

The subcommittee based both of these recommendations on a review of the performance by the contractors on TACAN procurement. "The delivery schedules," the report concludes, "have been amended many times. To date only slightly over 400 units have been delivered.

"The first production contracts were awarded in 1951. Unit cost estimates on this negotiated contract with price redetermination provisions cannot possibly be realistic. Moreover, the classified nature of the pilot production, on equipment developed at Government expense, has limited the production know-how to three or four firms."

Senate Concurrent Resolution 16, which calls for a joint Congressional investigation of the merits of TACAN and VOR/DME for use in the common system, is strongly endorsed. Passed by the Senate weeks ago, the resolution has been held up in the House Rules Committee. Rep. Percy Priest, chairman of the House Commerce Committee, had told Rules recently he saw no need for the joint investigation.

A final recommendation asks that the President review "the functions of ANDB, ACC, CAA and the military departments which are concerned with the implementation of the common system for air navigation, report to the Congress on the results of his study as soon as possible, and, if the study justifies it, submit a reorganization plan to create a logical, simple, and effective organization to carry out the task of planning for, developing, and enforcing a single and common system of air navigation." • • •

Slick Airways, Truckers File Joint Tariffs

Slick Airways and two trucking firms have filed joint tariffs with the Civil Aeronautics Board and Interstate Commerce Commission naming through rates for a door-to-door freight service, effective July 10.

Joining Slick in the tariffs were Associated Transport, an eastern trucking firm, and Western Truck Lines Limited. Service initially is to be between points served by Associated in the east and by Western in the west with Slick providing service between Cleveland, Pittsburgh, and Phoenix.

A typical shipment would be one from a small east coast city to Pittsburgh by Associated, thence on Slick to Phoenix, and via Western to destination.

The joint tariff, reflecting the idea raised when former CAB chairman Delos W. Rentzel took over Slick some months ago, is believed to be the first under Sec. 1003 of the Civil Aeronautics Act which calls for CAB and ICC to set up a joint governing board.

Air France Order Boosts L-1649A Backlog Over $100-Million Mark

Recent order by Air France for 12 Lockheed L-1649A Super Constellations (American Aviation, June 6) has hiked backlog at Lockheed California Division for the new model over the $100-million mark.

Air France's 1649A order is valued at about $32-million. It follows Howard Hughes' $70-million procurement of 24 of the thin-wing Connies for Trans World Airlines. Both are slated for delivery during the first half of 1957.

With these two sizeable contracts for the new model on its books, Lockheed is now looking ahead to additional orders to swell the total. Most talked of prospects at hand are Deutsche Lufthansa, reported to be arranging financing for four 1649As, and Air-India International.

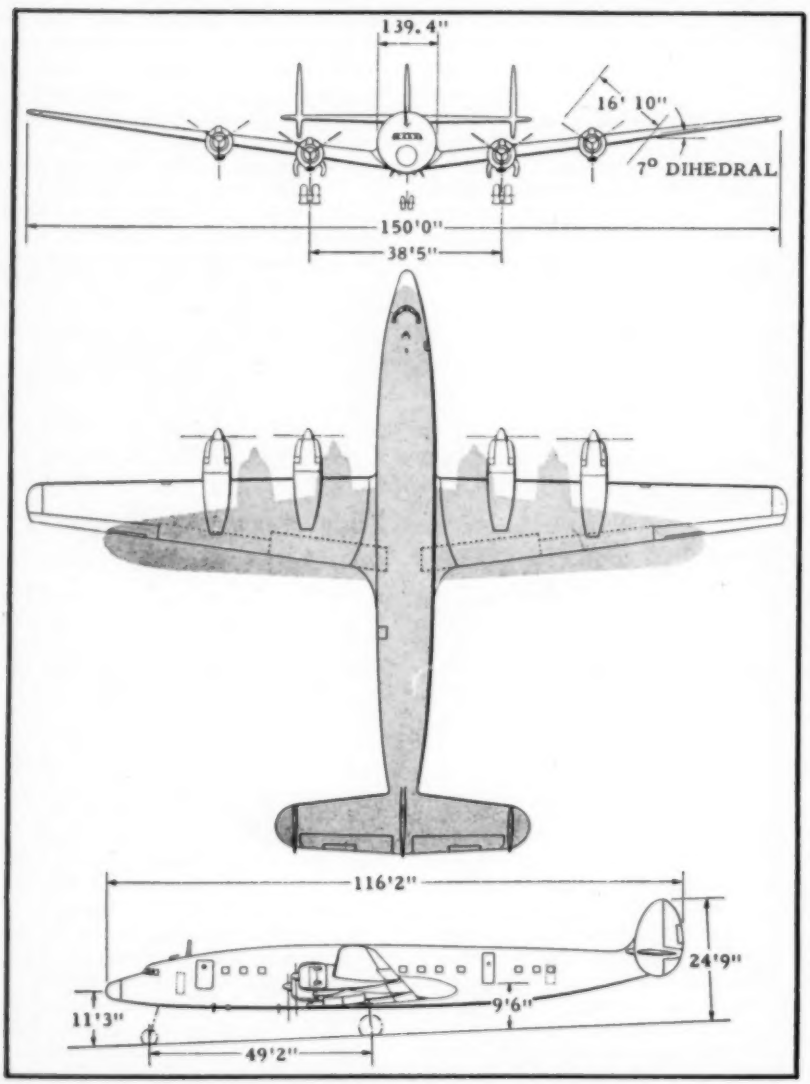
Beyond these Lockheed is proposing the high-speed model to the U. S. Air Force and Navy as the WV-4, an advanced version of current radar picket and command series now being produced.

Latest information released by Lockheed puts the top range of the 1649A at 6,500 miles, giving it endurance for more than 24 hours flying (plus normal reserves) while carrying 58-64 passengers in luxury cabin arrangement.

The 1649A, Lockheed says, will fly 70 mph faster than any other piston engine aircraft at ranges beyond 4,200 miles. Top speed is better than 400 mph and maximum cruising speed is 350 mph.

Takeoff gross weight of the 1649A is pegged at 156,000 pounds, an increase of 18,500 pounds over the latest 1049G series. Maximum landing weight is 123,000 pounds, a 10,000-pound jump from the 1049G.

Space limited payload of the new Constellation will be 17,000 pounds up to a range of 4,700 miles. It will carry more than 16,000 pounds payload for more than 5,000 miles. • • •



NEW LOOK IN LOCKHEED Constellations is shown here in comparative views of Model 1649A and predecessor 1049 aircraft. Standout feature is new thin wing with 150-ft. span, largest of any airline transport in service or on order. The 1649A has been ordered by both Trans World Airlines and Air France for 1957 delivery.

Fast Action Seen On Airport Aid

Fast action on the Senate $252-million airport aid bill was predicted by authoritative sources following two days of hearings on the proposal introduced by Sen. A. S. Mike Monroney, chairman of the Senate Commerce Committee.

Department of Commerce was lone dissenter to the contract authorization bill that provides grants-in-aid over the next four fiscal years.

Under Secretary Louis S. Rothschild objected strongly to the contract authorization feature of the bill and indicated that a commitment to spend $63 million per year was unnecessary.

• **Said Rothschild:** "We do not believe it is possible to forecast four years in advance the appropriate level of Federal airport aid. On one hand, air traffic growth and new technological developments will tend to increase the overall level of airport improvement . . . On the other hand, this same traffic growth should improve the financial results of airport operation, and may therefore make airport operators relatively less dependent upon Federal participation in financing of their projects."

Joining municipal, state and industry officials in urging the passage of the bill was CAB Chairman Ross Rizley. He revealed that because of inadequate airport conditions, the Board had been forced to suspend service at 88 points in the past four years, adding that the Board is convinced "there is a real need for more airports."

"The need," he stated, "lies in two fields. First, the building of new airports at suitable locations to permit the sound development of local service air transportation. Secondly, expanded facilities are needed at busy metropolitan centers, where booming traffic is already

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But, new developments in aircraft make new demands on men. And, to help train the pilots who will fly this delta-winged jet in the defense of America, Link has developed the first F-102 jet flight simulator.

Months of research were necessary, but now, USAF pilots train on the ground in conditions precisely duplicating those of the plane's air performance. Electronically, the Link simulator re-creates all the actual flight characteristics of the F-102. Airmen will pilot a familiar craft when they first "hit the air" in this vital air-defense weapon.

As man shrinks horizons, Link keeps pace with progress. Wherever men are planning today to conquer tomorrow's skies, you'll find Link.

Link invites applications from qualified engineers and draftsmen.

Manufacturers of world-famous Link trainers and simulators (such as F3D, B-47, F-89, F2H-2, F2H-3) • simulated aircraft instruments specialized computers • servo mechanisms • computer components gear boxes • friction over-drive clutches • precision potentiometers ratio voltmeters • phase angle meters • and other electronic devices

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overtaxing hard pressed facilities."

Rizley urged that buildings be continued in the program, noting that passenger and freight handling facilities are "becoming woefully inadequate."

• **Several amendments** were proposed by proponents of the measure. A. B. McMullen, executive secretary of the National Association of State Aviation Officials, recommended that an amendment be included in the bill which would allow state allocations to remain in effect for a four-year period, rather than being reallocated after one fiscal year as at present.

Mayor William B. Hartsfield of Atlanta, representing the American Municipal Association, recommended that the $252 million be allocated so as to allow $100 million to be committed in fiscal 1956, in order to catch up with the backlog, with the balance prorated as needed during the remaining three years.

Bendix Sets Ignition Conference Schedule

Bendix Aviation Corp. Scintilla Division will hold its 1955 ignition conference at Sidney, N. Y. on August 24-26.

Plan is to pattern this year's program after that of first session held during 1954 with discussions directed at Pratt & Whitney R2800 and R4360, and Wright R3350 engine ignition systems.

Attendance at the meeting will include representatives of military services, airlines, engine and spark plug producers, and the Civil Aeronautics Administration.

ANTENNA of the R.C.A. AVQ-10 weather mapping radar system. 200 C-band units using this antenna were ordered by United Air Lines (AMERICAN AVIATION, May 9, 1955) for installation on its fleet. The unusual "sliced-off" dish shown here provides a transmit-receiver beam width of aproximately seven degrees at a scan rate of 15 rpm.

Business

Are Renegotiated Contracts Destroying Competition?

Administration's opening bid this month for Congressional extension of the Renegotiation Act for two years has run headlong into Senate charges that Pentagon reliance on negotiated contracts is destroying competition.

During recent Senate hearings Air Force Secretary Harold Talbott said the charges are not true.

Talbott maintains that it is impracticable to depend on competition to keep costs of major procurement items like airframes and engines at a reasonable level. Defense Department, he states, is doing as much procurement by advertised bid as it possibly can.

Although he agrees that the government is practically guaranteeing manufacturers a profit, Talbott indicates renegotiation is controlling the situation. He estimates about $20 billion of the $35-billion Defense budget is renegotiable.

Opposing Talbott's stand, Senate Finance Committee—Chairman Harry F. Byrd (D-Va.)—expressed doubt that the USAF head shared the committee's views that competition is the "key to our economy." Committee members emphasized the need for new suppliers to bring "fresh ideas" into the industry and prevent "rigidity of thinking" in the relationship between Government and suppliers.

Talbot admitted that no precise standards exist for manufacturer profits, and that the 3.8% industry average net on sales after taxes was "a little too high."

Renegotiation Board Chairman Frank Roberts contended that heavy procurement and complex equipment is bound to generate excessive profits. He said more than $355 million had been returned to the Government since the Renegotiation Act of 1951.

Industry stand, expressed through the National Association of Manufacturers, is that renegotiation is either second guessing, which is contrary to all principles of contract law, or is a disguised tax which does not meet any criteria of a sound taxing system. NAM contends that the Government has lost money by renegotiation.

FACILITIES

• Board of directors of **Curtiss-Wright Corp.** has authorized $4-million initial expenditure for a new research and development facility to be located on an 84-square mile tract in Cameron, Clearfield and Elk counties, central Pennsylvania. Buildings will accommodate research and development activities, but some manufacturing is also planned.

• **Sanders Associates** has purchased offices and plant facilities totaling 500,000 sq. ft. in Nashua, N. H. for its expansion needs.

• Plans for a $450,000 administration and engineering building to be located opposite its present Los Angeles plant have been completed by **Cannon Electric Co.**

CONTRACTS

• **Lockheed Aircraft Corp.,** Georgia Div. will produce fabrication and subassembly tools for a late model helicopter under a contract with Sikorsky Aircraft.

• Parts for three assemblies of North American F-100D Super Sabre will be built by **Temco Aircraft's** Garland (Tex.) plant under NAA subcontract valued in excess of $1 million. Production will begin in July for first deliveries this year.

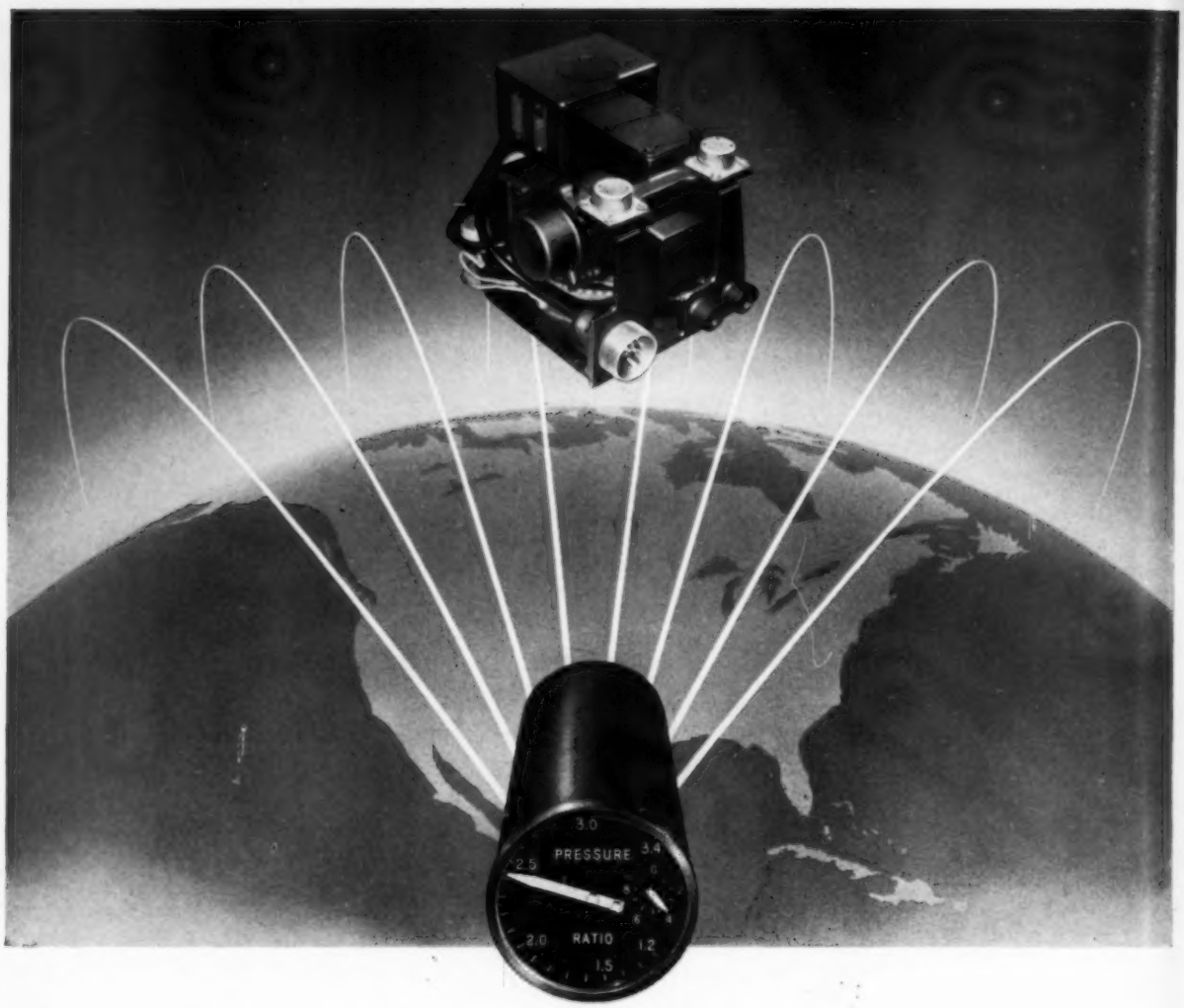
• **Ryan Aeronautical Co.** has received a contract exceeding $1 million for manufacture of a large number of afterburners for a new Curtiss-Wright jet engine.

PROFIT & LOSS

Firm	Period Ended	Current Net	Previous Net	Earnings Common Share Current	Earnings Common Share Previous
Calif. Eastern Avn.	1954	$ 319,881	$	$....	$....
Hawaiian Airlines	Q 3/31	(—)122,585	(—)207,382	....	....
Pan American	Q 3/31	1,700,000	161,000	....	....
Rolls Royce, Ltd.	1954	5,513,000	.....	....	....

DIVIDENDS

Firm	Period	Amount	Payable	Record Date
Chance Vought Aircraft	Q	40¢	June 28	June 10
North American Aviation	Q	75¢	July 6	
Temco Aircraft	Q	15¢	July 8	June 16



New transducer-indicator system

increases range of modern jet aircraft

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The new AiResearch pressure ratio system provides immediate, accurate thrust information by indicating the exact pressure relationship between the intake air and the exhaust air.

This allows the pilot to adjust throttle and controls in accordance with the Mach Number called for by his flight plan . . . particularly important under cruise climb conditions . . . to get maximum utilization of fuel and increased range. It also provides the positive thrust indication the pilot needs at take-off to determine when his loaded airplane is capable of becoming airborne.

This new pressure ratio system is another example of AiResearch ability to combine accuracy and reliability with ruggedness in equipment vital to high speed, high altitude aircraft.

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Pentagon Boycott Threatens RTCA

By JOSEPH S. MURPHY

FUTURE ROLE of Radio Technical Commission for Aeronautics in solving civil-military air navigation, communications and traffic control problems is now seriously threatened by signs of Pentagon "disinterest."

As a result, RTCA—for many years the most successful of government-industry efforts in resolving equipment and operating issues at the technical level—stands on the verge of being "left out" of future handling of key problems necessary to retention of a common civil-military navigation system.

Reason is that military services, primarily the U. S. Air Force, have openly indicated that RTCA no longer has "anything to offer" in providing a common meeting ground for all interested elements of civil-military aviation.

• **Most striking example** of this Pentagon change of heart is a recent vote in the all-government Air Coordinating Committee that placed the job of determining the operational requirements for the TACAN navaid in the Air Navigation Development Board instead of RTCA.

Such a study would have been a "natural" within the charter of RTCA's organization, but does not fit that of ANDB, a board which normally confines its efforts to technical development after operational data is supplied by ACC or RTCA.

To handle the project, ANDB is setting up an industry "advisory" group to coordinate operational needs of civil aviation.

ACC vote, which was carried by lower echelon military and CAA officials on the NAV Panel, was in direct conflict with policy set last year by Commerce Secretary Weeks and Defense Secretary Wilson in the re-organization of ANDB.

At that time, the new charter for ANDB made a specific point that the new Board was encouraged to "make maximum use of such groups as the Radio Technical Commission for Aeronautics."

• **Strongly opposed** to the "sacking" of RTCA, but without a voice in either ACC or ANDB, are all associations representing civil aviation including the Air Transport Association, National Business Aircraft Association, and Aircraft Owners and Pilots Association.

Some officials in these groups place equal blame for the weakening role of RTCA on CAA as well as the military.

Feeling is that CAA support of RTCA has deteriorated consistently since Fred Lee took over CAA reigns. In sharp contrast, Charles F. Horne, Lee's predecessor in CAA, was one of the strongest RTCA supporters and today still holds the post of RTCA technical advisor on the West Coast.

RTCA Today

Radio Technical Commission for Aeronautics was formed late in 1935 and today includes 120 members in its Assembly. Scope of this membership includes airlines, airframe manufacturers, electronic producers and service firms, and government agencies.

In 1948, RTCA was awarded the Collier Trophy for the work of its Special Committee 31 in developing the plan for a common system of air navigation.

During the discussion of whether RTCA should handle the TACAN operational study, CAA voiced the opinion that the operational study should be conducted by ACC's NAV Panel, but abstained when it came to actual voting.

As a result, the Army, Navy, Air Force and Coast Guard vote blocked a pro-RTCA decision over the supporting vote of CAB, Federal Communications Commission and State Department

• **Another typical** example of RTCA boycotting in the recent past was the naming of ACC's Special Working Group No. 13, a panel formed to study the transition stage of the common navigation system program.

Feeling is that this represented no more than a new look at what RTCA has set up as the original Special Committee 31 program, and should have been assigned in RTCA.

Some observers feel that the military opposition to RTCA stems from the furore generated on Capitol Hill by civil aviation supporters following the Air Navigation Development Board's pro-TACAN plan of action in the short-range navigation aid dispute.

By boycotting RTCA and directing future civil-military coordination activity to ANDB or ACC, military would be assured by an all-powerful vote of overcoming any meager opposition that

GHOSTS AND GOBLINS lined up in the de Havilland Engine Company's testing base at Hatfield, England, ready for delivery. Ghost (line at left) powers the de Havilland Venom series; Goblin (right) is used in Vampire trainers. Both are centrifugal flow jets. Ghost is rated at 5,050 lb. thrust, Goblin at 3,500 lb. In foreground are two Ghosts after jet pipe shrouds have been fitted.

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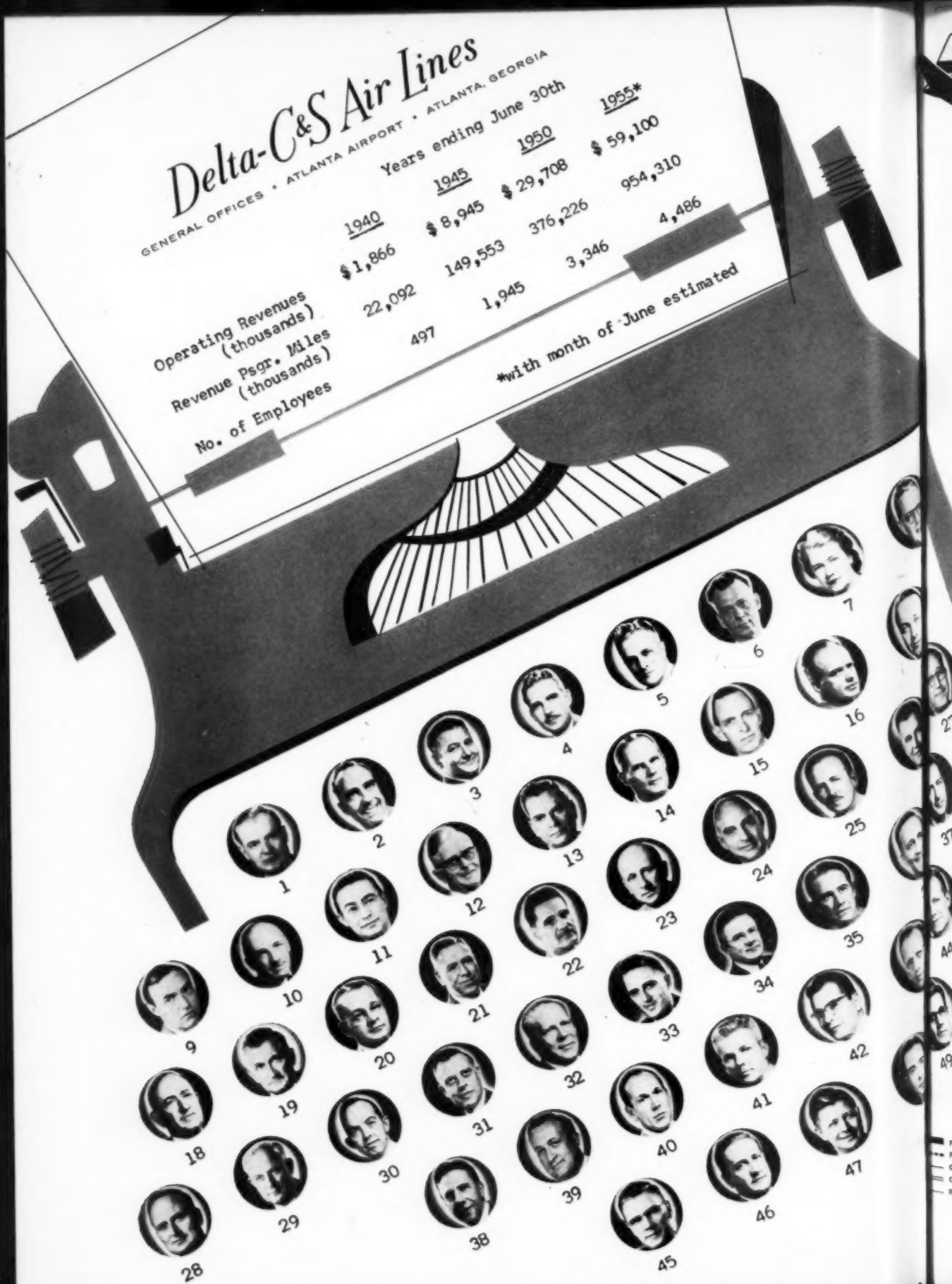
Years ending June 30th

	1940	1945	1950	1955*
Operating Revenues (thousands)	$1,866	$ 8,945	$ 29,708	$ 59,100
Revenue Psgr. Miles (thousands)	22,092	149,553	376,226	954,310
No. of Employees	497	1,945	3,346	4,486

*with month of June estimated



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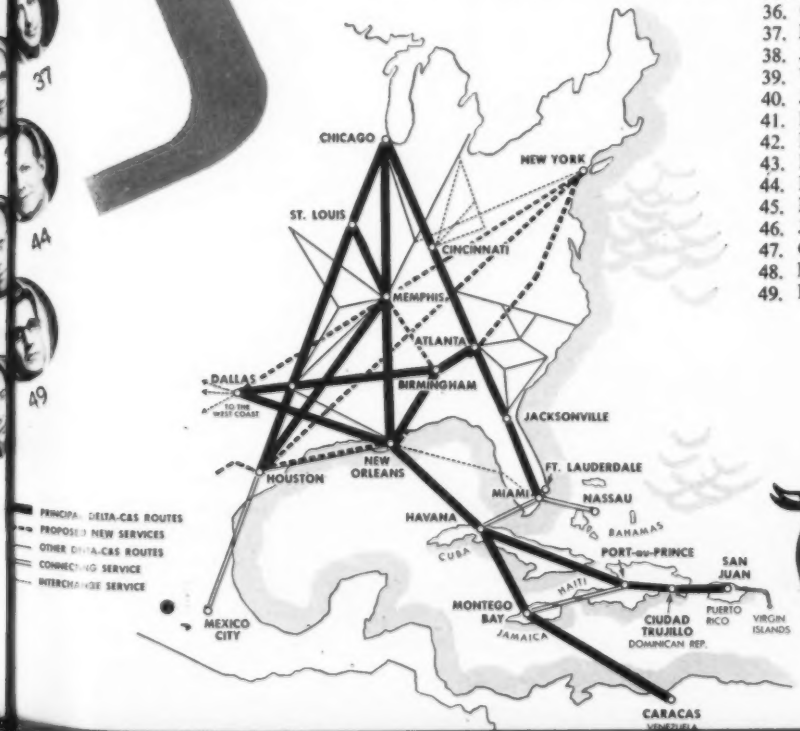
2. W. T. Beebe, VP—Personnel, 8 yrs.
3. Erle Cocke, Jr., VP—State Relations, 5 yrs.
4. Todd G. Cole, VP—Finance, Asst. Secy., 15 yrs.
5. R. W. Courts, Director, Atlanta, 7 yrs.
6. C. H. Dolson, Director, VP—Operations, 21 yrs.
7. Catherine FitzGerald, Asst. Treasurer, 29 yrs.
8. R. W. Freeman, Chairman of Board, New Orleans , 8 yrs.
9. E. H. Gerry, Director, New York City, 8 yrs.
10. J. R. Longmire, Director, St. Louis, 17 yrs.
11. R. S. Maurer, Director, VP—Legal, 12 yrs.
12. C. H. McHenry, Director, Secy., Treas., Monroe, La., 27 yrs.
13. T. M. Miller, Asst. VP—Traffic, Sales, 12 yrs.
14. Winship Nunnally, Director, Atlanta, 8 yrs..
15. L. C. Parker, Director, VP—Traffic, Sales, 21 yrs.
16. Carleton Putnam, Director, Washington, 22 yrs.
17. R. J. Reynolds, Director, Winston-Salem, 8 yrs.
18. J. W. Rodgers, Director, Dallas, 1 yr.
19. D. Y. Smith, Director, Monroe, La., 27 yrs.
20. R. H. Wharton, Jr., Asst. VP—Personnel, 19 yrs.
21. C. E. Woolman, Director, President and General Manager, 30 yrs.

KEY ADMINISTRATIVE PERSONNEL

22. T. P. Ball, Supt. Flight Operations, 19 yrs.
23. G. E. Bounds, Dir. of Advertising, 12 yrs.
24. T. P. Delafield, Gen. Sales Manager, 9 yrs.
25. G. J. Dye, Supt. of Maintenance, 19 yrs.
26. A. C. Ford, Supt. of Engineering, 10 yrs.
27. Finis Fox, Supt. of Stations, 18 yrs.
28. D. Garrett, Supt. Methods & Training, 9 yrs.
29. F. Herschelman, Jr., Supt. of Inspect., 9 yrs.
30. J. R. Howell, Gen. Accountant, Fin., 5 yrs.
31. W. D. Huff, Manager Customer Relations, 5 yrs.
32. E. M. Johnson, Dir. of Plan. & Research, 12 yrs.
33. D. W. Jurgensen, Asst. to VP—Personnel, 9 yrs.
34. D. F. Kell, General Attorney, 10 yrs.
35. J. S. King, Supt. of Flt. Control, 20 yrs.
36. C. P. Knecht, Admin. Exec. Traffic, Sales, 20 yrs.
37. I. Lasseter, Asst. to VP—Finance, 14 yrs.
38. J. W. Meyer, Genl. Traffic Manager, 19 yrs.
39. W. L. Miller, Supt. of Stores, 9 yrs.
40. J. F. Nycum, Mgr. Flt. Eqpt. Dev., 17 yrs.
41. P. W. Pate, Dir. of Properties, 12 yrs.
42. B. W. Price, Int. Audit Supervisor, 11 yrs.
43. L. G. Rodefeld, Supt. Communications, 18 yrs.
44. H. H. Saxon, Chief Accountant, 15 yrs.
45. F. J. Schwaemmle, Dir. of Info. Svcs., 20 yrs.
46. J. L. Sutton, Supt. of Psgr. Svc., 20 yrs.
47. C. B. Wilder, Dir. of Tech. Operations, 15 yrs.
48. M. D. Williams, Supvr. Ptg. and Dir. Mail, 3 yrs
49. K. T. Wilson, Purchasing Agent, 10 yrs.



Delta Air Lines, Inc., Operating as

Delta-C&S

might arise from CAA on behalf of civil aviation, it is contended.

And as long as top-level CAA apparently continues to look with disdain on RTCA handling of studies which fall within its scope, that general trend is taking shape.

Only possibility for a change, industry officials now view, is action in the Commerce and Defense Departments at the Secretary level to restore RTCA to its proper stature and so direct military, CAA and ACC policy.

Direct overlapping of certain ACC and RTCA activities was pointed out to these heads less than a year ago by the Bureau of the Budget but little or no effort has since been made to eliminate the conflict.

• **One other solution** could arise from present Congressional study of the controversial TACAN-VOR/DME hassle. Congress has openly taken a dim view of the manner in which the conflicting systems were bred under the "watchful eye" of ACC and ANDB and could place the entire controversy back in RTCA's hands for final resolution.

But without one of these measures, observers see little future progress toward coordinated effort among civil and military interests in air navigation, communication or traffic control. If the present Pentagon attitude gains momentum, it's a good bet that the committee rooms on Capitol Hill will more and more become the "coordinating grounds" for problems that should logically be handled by Radio Technical Commission for Aeronautics.

MODEL POINTS UP problems in VTO transports.

NACA Flies Transport VTO Model

The expanded research program of National Advisory Committee for Aeronautics into the performance of vertical takeoff transport aircraft has been extended to actual experiments with a remotely-controlled, free-flight model.

NACA tests, now in process at Langley Aeronautical Laboratory, are aimed primarily at discovering the stability and control features of VTO transports during the transition between hovering and forward flight.

Preliminary flight tests, however, have already been conducted to check performance of the model in takeoff, landing and hovering flight.

The flying model used at Langley is a 4-engine design weighing 51 pounds. Overall fuselage length is 84.8 in., wing span 92 in., and total wing area 1186.8 in.

VTO transport design selected by NACA calls for a full-span plain flap of about 65% chord which is deflected about 90° for hovering flight. In addition, eight extensible vanes are located above the wing in a cascade relation to turn the slipstream downward about 70° to produce direct lift for hovering.

Power for the model is supplied by a single 10-horsepower electric motor which drives four two-bladed, 20-in. diameter propellers.

Experience during early flight tests, NACA reports, showed these results:

• **Flight of the model** without use of artificial damping in pitch was difficult for the "pilot" because of a violently unstable pitching oscillation.

• **This condition** could be stabilized by use of a rate-sensitive artificial damper which also made the pitching motion easier to control.

• **Rolling motion** was slightly divergent but was fairly easy to control.

• **Yaw control** was considered undesirably weak, although pilot could generally maintain control in yaw.

NACA tests also showed the stabil-

Deluxe Executive Lodestar

• **Engines:** New Wright R1820-72A, test run time only—Engine accessories, zero time since overhaul • **Propellers:** Hamilton Standard 6511-A-12S Mirror finished, full-feathering • **Fuel System:** Latest CAA-approved dual type; 160 gallon auxiliary fuel tank installed • **Brakes:** High pressure, disc type • **Radio:** 1 Bendix (50 watt) RTA-1B transceiver, 1 Collins ARC-1 50 channel VHF transceiver, 1 Wilcox (50 watt) 440A VHF transmitter-receiver, 2 Bendix R5/ARN 7 ADF systems, 1 Collins integrated flight system, 1 Collins 51R-3 omni receiver, 1 ARC F-11A isolation amplifier, 1 Pioneer fluxgate compass system, 2 MI-51A Bendix cockpit speakers • **Cabin:** Craftsman RC-10 AM-FM radio with four Altec Lansing speakers, Cockpit-cabin interphone and public address system • **Airframe:** Knife-edge installation and bat wings removed • **True Air Speed:** 225 MPH at 9,000 ft. • **Passengers:** 10 • Complete anti and de-icing system. High pressure oxygen system for crew and passengers.

We own the aircraft we offer!

Call, write or wire: Herrol Bellamy, executive vice president or Mort Madden, aircraft sales manager, L. B. Smith Aircraft Corporation, International Airport, Miami 48, Florida—Phone 64-0611.

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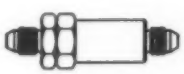
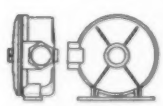
Special lightweight filter designs SERVE VARIETY OF AIRCRAFT APPLICATIONS

G-159J and G-198J— Main line hydraulic, monel or stainless element, aluminum body. Knife blade cleaning. Two sizes give wide range of capacity.

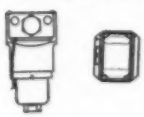
G-200M — Hydraulic actuating valves and cylinders. Two-way restrictor stops dirt for either direction of flow. Available with either internal or external connections.



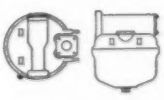
G-205M — Hydraulic pipe lines. Light weight—1¾ oz.



PA-12-8—Intake filter for instrument air Micronic* element. Weight 25 ounces. Removes dust and vapor.



PR-400 series. High pressure hydraulic line, ½, 3, 6 & 12 G.P.M. military approved (MS-28720).



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SPECIAL MODELS ARE AVAILABLE

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Please send me the following filter information

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ity and control features of the model to be as good when hovering near the ground as those obtained when hovering at considerable heights.

Vertical takeoffs and landings could be performed satisfactorily. But when the model was trimmed for hovering high above the ground, it had a slight tendency to move forward as it took off or neared the ground on landing.

General conclusion of NACA technicians was that the behavior of the model was unacceptable in comparison with that of other flying models. Whether this behavior of a full-scale airplane would be considered tolerable could not be definitely ascertained from the tests.

Feeling is that the conditions experienced might be considered barely acceptable for an airplane if they were only of an emergency nature, as in the event of an autopilot failure.

Current model tests at NACA followed earlier flight tests of a simplified test vehicle by the Langley free-flight tunnel group. Decision to expand the program to actual model flights was made after these earlier experiments indicated that stability and control of an airplane of this type could be "fairly satisfactory" in hovering flight.

Detailed report of the preliminary flight tests has been prepared by Langley's L. P. Tosti and E. E. Davenport. NACA has also prepared a motion picture film of the model flights which is now available for loan from its Washington headquarters.

NACA's VTO Transport
(Model Specifications)

Weight	51 lbs.
Fuselage length	84.8 in.
Wing span	92 in.
Wing area	1186.8 sq. in.
Wing	
Sweepback	0 deg.
Aspect ratio	7.13
Dihedral angle	0 deg.
Vertical Tail	
Sweepback	5 deg.
Aspect ratio	7.54
Area (to C/L)	169.1 sq. in.
Span	18.125 in.

Horizontal Tail	High Position	Low Position
Sweepback	7.3 deg.	7.3 deg.
Aspect ratio	5.81	6.17
Area (to C/L)	241.9 sq. in.	269.4 sq. in.
Span	37.5 in.	40.75 in.

New Cessna Door Stresses Safety

Cessna Aircraft Co.'s Model 310 twin executive aircraft is getting a new bolting system on the main entrance door that is claimed to be one of the safest and most functional yet developed.

New system bolts the door at the top, bottom and side opposite the hinges, with all bolts operated from a single handle.

Door operation is simple—a slam will latch it and a turn of the handle engages the top and bottom bolts. Mechanism employs special bolts and an over-center locking feature that compensates for manufacturing tolerances and prevents any possibility of inadvertent opening in flight.

Entire system was designed for Cessna by Adams-Rite Manufacturing Co. of Glendale, Calif.

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When you're doubly geared for action, any job can be made *twice* as easy . . . and dual ARC Omni installations double flight efficiency, increase the pilot's confidence in navigation. With dual omni 15D equipment, a single pilot can make a fix *faster* . . . he can fly any omni track while also cross-checking for position. It's easier to make transition from omni to runway localizers.

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ARC 15D Omni is compact, lightweight, CAA certified, and now employs new course indicator which combines course selector and cross-pointer meter in a single space-saving unit.

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GE Electronic Assembly Holds Promise for Small Business

Designed for small and big producers, 'ACAS' is likely to change thinking of electronics industry.

By HENRY P. STEIER

The common concept of automation as a production technique for the "big fellows" in the electronics industry is due for revision when the General Electric Co.'s "Automatic Component Assembly System" (ACAS) is considered.

Until recently, widespread use of automation by the "little fellow" has seemed severely handicapped by the high production and first cost factors inherent in the trend to larger and more complex automation machinery.

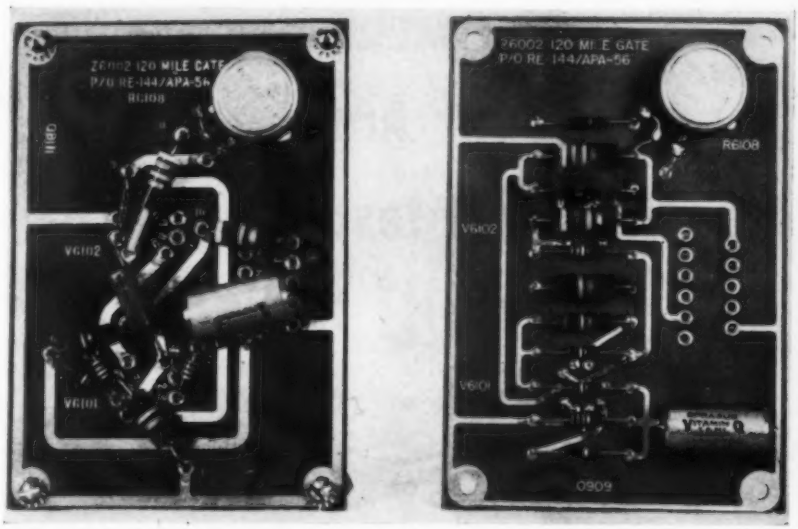
Military electronic equipment, produced in many cases in lots of a thousand or less, presents a challenge to small producer use of automatic assembly. The factors of low volume and frequent unit design changeovers have a serious economic effect because of machine down-time during set-ups to make a variety of products.

GE's vice president and general manager of the company's Electronics Division, Dr. W. R. G. Baker, believes, "The key to widespread use of automation is flexibility," but that "in applying the technology, the manufacturer must measure the pace of progress to determine how extensive the application should be."

Adaptable to the needs of big and small producer alike, GE's ACAS machine was designed on the basis of studies of existing mechanized component placement schemes with respect to performance, economics, compatibility with airborne electronic equipment, analysis of component structure and production requirements for existing designs.

• **Mechanized standard** component placement, a basic function of United Shoe Machinery Co.'s and General Mills Co.'s new automatic machines, and the mechanized fabrication and assembly of "Tinkertoy" electronic building blocks produced by ACF Electronics Division, are the two basic approaches currently in use.

The analysis and interim "unitized" machine that led to GE's approach to job-lot automation through ACAS was discussed by Arthur F. Maynard of GE's Light Military Electronics Equipment Department at the recent Electronic Component Conference in Los Angeles. It was determined there were two component placement head concepts; in-line with a different mechanical head for inserting each component, and unitized with a single head to handle all components. Deciding the best type of machine for specific needs depends upon the existing electronic equipment design to be produced and the production volume requirement, GE's investigators found that printed wiring boards were the common denominator of all existing placement systems. Examining GE's LMEED production operations over several past years, they found diversified, short production runs were typical on certain electronic subassemblies amounting to lots of 25 to 40 units.



"Before and after" arrangement of components on a printed wiring board functional unit redesigned to permit machine placement of "standardized design" components.

• **Analysis** of components on 50 printed wiring boards used for functional subassemblies that perform a complete electrical function, and can be independently manufactured and tested, was made to determine the predominant type of component. Boards were representative of search radar, Sonobuoy, gun fire-control, and countermeasures equipment. Functional circuits were: servo, regulator, sweep, IF, and video amplifiers; diode mixers; hi-voltage oscillators; power supplies.

• **Accounting for** 58 per cent of the total of 2254 components on the 50 boards were carbon resistors, of which one-half watt values comprised 72 per cent of the total resistors.

• **Capacitor components** totaled 149 tubulars, and 287 of mica "postage stamp" type.

• **Together,** capacitors and resistors formed 77.7 percent of the total components. Remaining components were vacuum tubes and hardware mounted components varying in size and shape.

• **Average** functional assembly had 45 components. Thirty-five of these were adaptable to machine placement. Five of the remaining ten were vacuum tubes.

Concentrated on the components of the 77.7 per cent group, a size analysis was performed to determine lead wire spacing and diameters of cylindrical and rectangular components.

• **Apparent** from these studies were two factors determining possibility of short economical production runs by automatic means: necessity for a standardized assembly design to accommodate the 77.7 percent majority of components, and reduced machine set-up time to handle short production runs economically.

From the size and lead spacing analysis, it was shown a printed circuit board with mounting holes drilled on a 0.1 inch incremental grid pattern would permit mounting "standardized design" components in parallel rows with equivalent spacing between formed component leads. Standard component lead spacing between formed leads was 1.2 inches.

• **Reduced** set-up time was achieved by adopting a "unitized" placement head.

TOMORROW'S AIRCRAFT: *One step closer*

Air Arm has what it takes to develop and produce the best in airborne electronics equipment. A key factor is the Flight Test facility that puts systems through actual tactical situations . . . a facility that is second to none in the industry.

Far from being a fledgling in this activity, Air Arm's Electronic Flight Test Center is three years matured and still expanding. This unique facility is at the main plant and connected by taxi strip to Baltimore's modern Friendship International Airport. Westinghouse owned and operated, it consists of 48,000 square feet of hangar area, electronic test and administrative sections.

FIGHT Testing airborne systems is the job of Air Arm's Flight Test Center. Here, eight former military pilots, men with aviation backgrounds which total over a century of flying experience, keep as many as 16 prop and jet aircraft on the go. They subject equipment to every possible airborne rigor *before* it goes into operational aircraft. 110 highly trained and experienced Flight Test personnel—engineers, technicians, mechanics, armorers and aerologists are working hand in hand to insure that pilot, aircraft and airborne system form a perfectly matched combination for peak efficiency and performance.

Air Arm Flight Test is one of the many specialized facilities which enable us to produce the best in airborne electronics equipment and . . . to help you bring tomorrow's aircraft . . . One Step Closer. Westinghouse Electric Corporation, Air Arm Division, Friendship International Airport, Baltimore 27, Maryland. J-91030-B

Chief Project Pilots, Tom Lloyd and Fred Hughes, join on the ground, prior to debriefing, following an afternoon air-to-air gunnery check on a fighter armament system.

THE AIR ARM SYSTEMS FAMILY . . .

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- **Bomber Defense**
- **Flight Control**
- **Missile Guidance**
- **Special-Purpose**
- **Systems Components**

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Among important activities at Hughes is a program involving comprehensive testing and evaluation in connection with Hughes-developed radar fire control and navigation systems for latest type military all-weather interceptors.

Convair F-102 all-weather interceptor.

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There is need on our Staff for qualified engineers who thoroughly understand this field of operation, and who have sufficient analytical and theoretical ability to define needed tests; outline test specifications; assess data derived from such tests, and present an evaluation of performance in report form.

Engineers who qualify in this area should have **1** *a basic interest in the system concept and over-all operation of test procedures;* **2** *experience in operation, maintenance, "debugging," development, and evaluation testing of electronic systems, and knowledge of laboratory and flight test procedures and equipment;* **3** *understanding of basic circuit applications at all frequencies;* **4** *initiative to secure supporting information from obscure sources.*

Hughes

RESEARCH AND DEVELOPMENT LABORATORIES

SCIENTIFIC AND ENGINEERING STAFF

Culver City, Los Angeles County, Calif.

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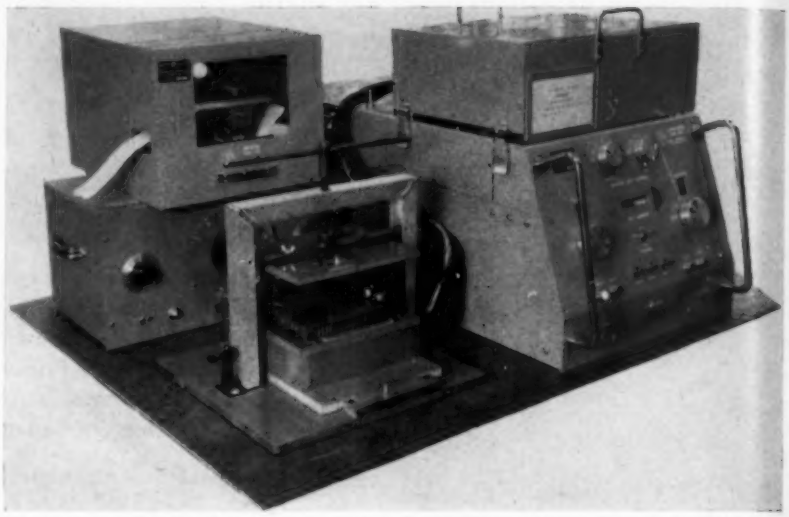

AUTOMATIC TESTER for go-no go testing of functional electronic units. Requiring one operator, the tester does the job in one minute, and does the work formerly performed by 14 semi-skilled workers and seven technicians. The paper tape provides a record of data measured units.

Based upon available published information on machine speeds, GE found that for small lot sizes the "unitized" machine outproduces the "in-line" machine under conditions where 35 components must be placed and where the lot size is about 25 to 40 units. Set-up time on the "in-line" machine is 360 per cent greater, according to GE.

For lot sizes of about 25, GE claims its ACAS machine, expected to be operating late this year, will outproduce the "in-line" machine by two-to-one, under the stipulated condition of 35 components.

The "unitized" component placement machine, built after GE's study, consists of a preparation station for lead cutting and forming, and a placement station. Components are placed sequentially under a single head and the leads crimped. There are 40 component stations which have capacities of 56 to 136 components, depending upon component size.

The ACAS machine, incorporating automatic preparation, component test, placement, dip soldering, and circuit tests, is a further refinement of the "unitized" principal, having punched card control for automatically programming changes of components and circuit boards.

The number of components that can be handled by a "unitized machine may be increased through establishment later of uniform lead wire sizes, material, finish, and component length. Also, designed shape factors and component packaging methods would be an aid. Standardization of these parameters will help establish a sound basis for further economies possible in small producer use of mechanized electronic production with the less costly "unitized" machines.

	"IN-LINE"	"UNITIZED"
Placement speed	20 per min.	30 per min.
Time Per Board	3 seconds	80 seconds
Set-up time	72 min.	20 min.

GE's comparison of two component placement systems based upon small lot runs and placement of 35 components.

Lot Size	Annual Production Capacity—Units "IN-LINE"	"UNITIZED"	"ACAS"
15	24,000	45,000	78,600
25	41,000	57,000	80,000
100	156,000	78,000	81,600
00	2,400,000	90,000	82,300

Number of units in different lot sizes that GE says determines the type of automatic electronic component placement machine to use.

450° F Tachometer Generator

meets modern jet engine requirements

Military specification numbers as used herein are for purposes of product identification only and do not necessarily imply specification conformity.

For use on high performance jet aircraft, the new Jack & Heintz Model H60-164 is a two-pole tachometer generator designed to meet MIL-G-9398.

By utilizing special design elements, this generator operates accurately at the higher altitudes and critical heat associated with advanced flight. It provides reliable and accurate engine speed indication not attainable through the use of present conventional units at a temperature of 450° F.

The special design features which enable J&H to give this performance are:

1. Heat-treated, magneto-type ball bearings.
2. Teflon-insulated magnet wire.
3. Wide temperature range greases for operation from −90° F to +525° F. *The new J & H unit has a breakaway torque of only 1 to 2 inch-pounds after 48-hour soak at −90° F as contrasted to the specified 12 inch-pounds.*

In the past five years, Jack & Heintz has supplied over 100,000 small, lightweight, permanent-magnet a-c tachometer generators to the Military, aircraft engine and accessory manufacturers and commercial airlines. The entire product line includes *sensing units* and *power sources* for:

1. Rpm indication
2. Propeller synchronization
3. Aircraft engine analyzers
4. Electronic jet-engine fuel controls
5. Turbine power packages

Whether you want a tachometer generator or any type of small permanent-magnet a-c generator, look to J & H for the answer. For complete information, write Jack & Heintz, Inc., 17633 Broadway, Cleveland 1, Ohio. Export Department: 13 East 40th Street, New York 16, N. Y.

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Ar. Los Angeles (PDT)	3:35 pm	5:35 pm	9:35 pm
Lv. Los Angeles (PDT)	9:00 am	9:00 pm	11:00 pm
Ar. New York (EDT)	7:40 pm	7:40 am	9:40 am

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AMERICAN AIRLINES
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LOS ANGELES

People

MANUFACTURING

John R. Alison named vice president in charge of customer relations, Northrop Aircraft, Inc., succeeding **John W. Myers**, resigned; **Robert R. Miller**, becomes v.p.-administration; **J. G. Nettleton** moved up to asst. to the president.

ALISON

Russell (Rusty) Roth promoted to chief experimental test pilot for Republic Aviation Corp.

William D. Perreault, formerly managing editor of AMERICAN AVIATION magazine, made military sales representative of Lockheed Aircraft Corp. at Marietta, Ga.

Louis B. Peltier named west coast mgr. of contractual engineering for United Aircraft Products, Inc.

F. Glen Nesbitt named supervisor of sales for flight and engine instruments, Aeronautical Equipment Div., Sperry Gyroscope Co.; **Vincent F. Acri** will handle sales of flight control systems.

William E. Murray appointed staff asst. to gen mgr., Aircraft Products Div., of Kawneer Co.; **Milton H. Hoffman** appointed chief engineer; **Cecil L. Ort**, production mgr.

Donald W. Cook joined LearCal Div. of Lear, Inc., as asst. gen. mgr.

Robert P. Lord elected exec. v.p. and treas., and **David Fromson** named secretary of Greer Hydraulics. Inc.

Raymond F. Hall appointed asst. v.p. of Eastern Div., Van Dusen Aircraft Supplies.

Harold M. Niles announced mgr. of Navy contracts for Ford Instrument Co., div. of The Sperry Corp.

Walter B. Powell appointed gen. mgr. of Chicago branch, Air Associates, Inc.

L. R. (Mike) Hackney will head new military relations dept. at Fairchild Aircraft Div.; **Stephen H. (Steve) Jump** named asst. dir. of military relations; **W. H. Arata, Jr.**, named chief of operations engineering.

HACKNEY

Mark R. Miller appointed gen. mgr. of Defense Div., Servel, Inc.; **John N. Davidson** continues in charge of engineering and manufacturing.

Dan W. Burns made director of procurement and **A. H. Knight** appointed asst. purchasing agent of Menasco Mfg. Co.

Mathias Klein appointed chief mfg. engineer of Marquardt Aircraft Co.

James E. Mays joined Southwest Airmotive Co. as asst. mgr. of jet engine overhaul operations.

Vernon E. Hupp, Jr., appointed asst. service mgr. of United Aircraft Service Corp. for Hamilton Standard products.

Harry A. Sosnoski named aviation advisor to the president of Olin Mathieson Chemical Corp.

Emerson S. Reichard, Jr., elected asst. secy. of Aerojet-General Corp.

Horace G. Prall promoted to director of quality at Piasecki Helicopter Corp.

J. H. Stickney appointed aircraft sales mgr., Holley Carburetor Co.

Carl J. Eaton named director of engineering and **L. R. Lentz** asst. director at Champion Spark Plug Co.

Willys Motors, Inc. announced the following promotions: **Harry E. Payne** to sales mgr., **George A. Schnug** to mfg. mgr., and **Edward G. Hayes** to administrative mgr.

John A. O'Brien becomes supt. of Spencer Div. of Metals & Controls Corp.

Walter B. Voisard promoted from project and field engineer to sales and service mgr. of McCauley Industrial Corp.

Dow Corning Corp. named **J. F. Dellaria** special coordinator between its laboratories and aircraft industry.

Capt. William J. Vander Schans, former Air Force mfg. div. representative on missile project staff at Northrop Aircraft, Inc. appointed ass't to the president of that company.

Leonard K. Schwartz appointed director of commercial aircraft sales for Lockheed Aircraft Corp.; **P. K. Yost, Jr.**, succeeds Schwartz as director commercial sales, California Div. **Lewis H. Height** goes to Marietta as chief project engineer from project engineer for the P2V Neptune, Calif. Div.

Kenneth Davis named western regional mgr. of Kaylock Div., The Kaynar Co.

SALMON

LEVIER

A. W. (Tony) LeVier appointed director of flying operations for Lockheed Aircraft Corp.'s California Div. **Herman R. (Fish) Salmon** succeeds LeVier as chief engineering test pilot.

AIRLINES

George S. Lapham, Jr., joined legal staff of Air Transport Assn.

Frederick Quanjer promoted to U. S. asst. sales mgr. of Swissair; **Joseph Verini** named district sales mgr. for New York area.

Arlindo Moura appointed gen. mgr. for the U. S. of Real-Aerovias Brasil System.

Jacques Nicolle made gen. traffic and sales mgr. for North and Central Amer. and Caribbean Div. of Air France.

MILITARY

Rear Adm. Stanhope C. Ring, USN, succeeds **Rear Adm. Thomas B. Williamson** as vice commander of Military Air Transport Service.

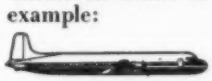
Dr. Thomas J. Killian named deputy chief and chief scientists of Office of Naval Research.

Col. R. W. Gustafson named exec. ass't to Ass't AF Secretary Roger Lewis.

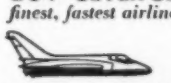
Engineers!

Join this winning team!

At DOUGLAS you'll be associated with top engineers who have designed the key airplanes and missiles on the American scene today. For example:



DC-7 "SEVEN SEAS" *America's finest, fastest airliner*

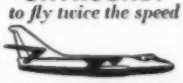


F4D "SKYRAY" *Only carrier plane to hold world's speed record*

C-124 "GLOBEMASTER" *World's largest production transport*

NIKE *Supersonic missile selected to protect our cities*

"SKYROCKET" *First airplane to fly twice the speed of sound*



A3D "SKYWARRIOR" *Largest carrier-based bomber*

A4D "SKYHAWK" *Smallest, lightest atom bomb carrier*

B-66 *Speedy, versatile jet bomber*

With its airplanes bracketing the field from the largest personnel and cargo transports to the smallest combat types, and a broad variety of missiles, Douglas offers the engineer and scientist unequalled job security, and the greatest opportunity for advancement.

For further information relative to employment opportunities at the Santa Monica, El Segundo and Long Beach, California, divisions and the Tulsa, Oklahoma, division, write today to:

DOUGLAS AIRCRAFT COMPANY, Inc.

C. C. LaVene, Employment Mgr.
Engineering General Office
3000 Ocean Park Blvd.
Santa Monica, California

10 years of post-war progress in military aviation

These are some of the aircraft and missiles developed and built by Douglas within the past decade to provide solutions for almost every logistic and tactical problem confronting our military establishment.

But more important to our national defense than the aircraft themselves, is the experienced personnel that brings them into being. At Douglas this experience dates back 35 years, and is spread among thousands of men and women whose combined talents made possible: Globemaster's lift of 50,000-lb. payloads; Skyray's record of 753.4 m.p.h.; Skyrocket's speed of 1327 m.p.h.; new military horizons opened by such jets as the A3D, B-66 and A4D; guided missiles like Nike and rockets like Honest John.

This vast arsenal of experience made possible the Douglas concept of more performance per pound of plane; which is another way of saying— ***more defense for your tax dollar.***

F4D Skyray

Only carrier plane to hold speed record

C-124 Globemaster

Biggest production transport, 25-ton payload

A4D Skyhawk

Can take off from small carrier with A-bomb

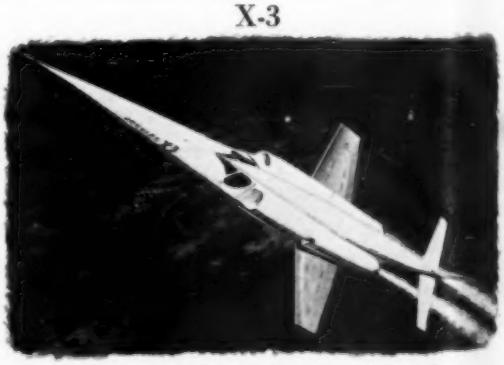
Honest John

Delivers atomic or high explosive warhead

YC-124B

First military transport to use turboprop power

X-3



Jet research plane, performance classified

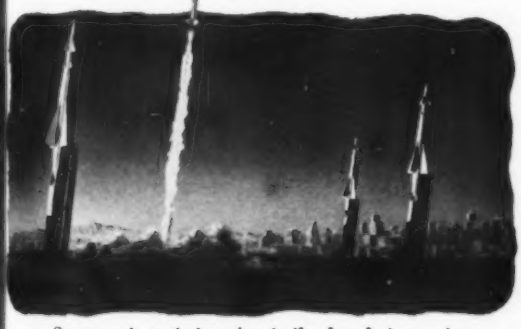
A D Skyraiders

Called world's most versatile aircraft

C-118A–R6D

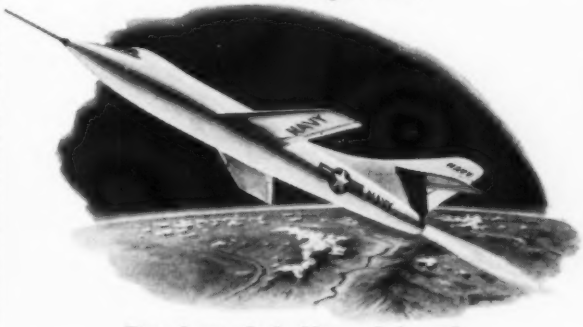
Air Force and Navy versions of the DC-6A

Nike Rocket



Supersonic anti-aircraft missile already in service

D 558-2 Skyrocket



First plane to fly double speed of sound

A 3 D Skywarrior

Navy's largest carrier-based bomber

RB-66

Versatile Air Force reconnaissance bomber

F 3 D Skyknight

Twin-jet, radar-guided night fighter

Depend on

DOUGLAS

First in Aviation

New Products and Processes

AIRCRAFT HEATERS

Janitrol Aircraft - Automotive Division of Surface Combustion Corp. has introduced a complete line of new aircraft heaters for business aircraft installation.

Four new heaters range in weight and capacity from a Model S-25 rated at 25,000 Btu/hr. and weighing 16½ lbs. to the Model S-200 weighing 27 pounds and having a 200,000 Btu output.

Intermediate models are rated at 50,000 and 100,000 Btu and weigh 20½ and 22½ lbs. respectively. Models are the S-50 and S-100.

Here's how Janitrol pairs new heaters with aircraft types:

S-25—Aero Commander, Bell 47H helicopter.
S-50—Beech B-50, Sikorsky S-55, Lockheed Constellation.
S-100—Douglas DC-3, DC-4, Curtiss C-46 and North American B-25.
S-200—Douglas DC-3, Convair 340 and Martin 4-0-4.

Circle No. 102 on Reader Service Card.

FLIGHT INSTRUMENT

Lear, Inc., LearCal Div. has unveiled a new 3-in-1 blind-flying instrument that combines in a single display all data formerly presented on conventional directional and attitude gyro indicators.

Called NAFLI (natural flight instrument), new Lear unit indicates aircraft attitude by means of pointers shaped to portray its silhouette as seen in profile.

The pitch pointer depicts the airplane as viewed from the right wing

tip. A roll pointer silhouettes the aircraft as viewed looking forward from behind the tail.

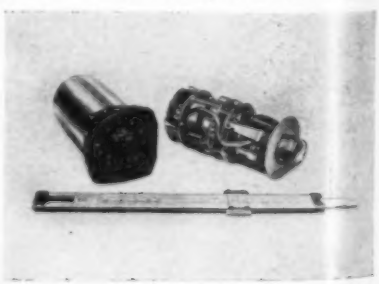
Type of presentation finally selected, Lear states, was the result of extensive experimentation on pilot reaction time and ease of interpretation.

NAFLI system is designed to meet military environmental specifications. Gyroscopes and associated electronic equipment mount on a ½ ATR rack and all three indicators fit a single 3⅛-in. dia. case. System weight is about 27 pounds.

Circle No. 100 on Reader Service Card.

FUEL INDICATOR

New dual display fuel quantity indicator announced by Avien, Inc. pro-



vides both totalized and individual tank gauging.

Unit uses two independent servo-

ARE YOU SEEKING

Security

for new plant location?

LOOK FIRST TO OGDEN, UTAH

Moderately-priced, level sites in Ogden comply with industrial dispersion criteria established by the Office of Defense Mobilization and the Department of Commerce.

In addition, Ogden offers a central location and the largest rail switching terminal in the West . . . plus 12 motor truck lines for fast, convenient service to and from all major aircraft plants and allied industries. Electric power rates 21% below national average . . . natural gas available.

QUALITY LABOR FORCE . . . the highest education standard in the nation . . . twelve year median of school completed. 60% of the people own their own homes . . . 78% belong to churches representing 22 denominations. .

ALL COMMUNICATIONS IN STRICTEST CONFIDENCE.

For Additional Information, Contact Daniel D. Dale, Manager

WEBER COUNTY INDUSTRIAL BUREAU

SUITE 235 HOTEL BEN LOMOND OGDEN, UTAH

Circle No. 17 on Reader Service Card.

Ask the pilots with the most experience . . .

Joan Tesch and Albert Swartz, co-owners of the Sky-Way Crop Dusting Co., stand with one of their crop-dusting fleet.

ask Albert Swartz . . .
ask Joan V. Tesch . . .

CO-OWNERS AND PILOTS FOR SKY-WAY CROP DUSTING COMPANY, MARSHALL, MICHIGAN

Joan V. Tesch, possibly the only lady "crop duster," says: "I've flown the last 8 years with Gulf products. There aren't any aviation products better for our specialized type of flying."

Albert Swartz says: "I've been an exclusive user of Gulf Aviation Products for the last 4 years. I consider Gulf Aviation Gasoline and Gulf Oils as real insurance against engine trouble."

For safer flying, get acquainted with . . .

Gulf Aircraft Engine Oil, Series-R

For radial engines, or where a detergent oil is not desired. Approved by Pratt and Whitney and other radial engine manufacturers for all types of service. Retards sludge and carbon formation and retains its body at high operating temperatures.

Gulfpride Aviation Oil, Series-D

For horizontally opposed and Ranger in-line engines. Minimizes ring and valve sticking, oil consumption, oil-screen clogging and plug fouling. Users of this great detergent oil have increased periods between engine overhauls by as much as 100%.

Gulf Aviation Gasoline

It's "refinery-clean" for your safety because Gulf Aviation Gasoline dispensing units are equipped with advanced Micronic Filters.

GULF
AVIATION PRODUCTS

GULF OIL CORPORATION · GULF REFINING COMPANY

Circle No. 18 on Reader Service Card.

ENGINEERS AND SCIENTISTS

You'll find at

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

ENGINEERING FOR THE FUTURE

CAREER OPPORTUNITIES EXIST IN:

AERODYNAMICS

Aero-Analysis — Theoretical Aerodynamics
Performance — Experimental Aerodynamics

AEROPHYSICS

Stability and Automatic Control — Armament Analysis
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PROPULSION

Propulsion Research — Propulsion Development
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NUCLEAR PHYSICS

Theoretical Nuclear Physics
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Structural Research — Structural Loads

DESIGN for AIRCRAFT and NUCLEAR APPLICATION

Airframe Structures — Electrical
Thermodynamics — Electronics
Mechanisms — Equipment Design
Power Plant Installations

ENGINEERING TEST

Flight Test Instrumentation — Data Reduction
Fluid Dynamics—Electronic, Electrical—Structural

It is required that applicants for these positions have formal education in Aeronautical, Mechanical, Civil or Electrical Engineering, Physics or Mathematics—or professional experience in one of the fields above.

At CONVAIR you have an excellent opportunity to do graduate work—in plant or in evening college. CONVAIR offers liberal travel allowances, paid vacations, excellent insurance and retirement programs.

Send Resume to M. L. TAYLOR
CONVAIR, Engineering Personnel Dept. PP
FORT WORTH, TEXAS

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

FORT WORTH, TEXAS

driven indicating mechanisms to provide dual readings. A five-digit counter display shows total fuel on board and a standard pointer indicates individual tank quantities over a 230° dial-edge scale.

Circle No. 101 on Reader Service Card.

AXIAL BLOWERS

New line of axial flow blowers developed by Plannair, Ltd. of England for airborne applications will be produced by Pesco Products Div., Borg-Warner Corp.

New series range in size from a miniaturized 16 cfm unit weighing only

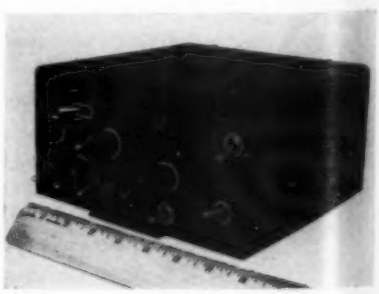
eight ounces to blowers of 750-cfm output. Smallest model measures 1⅜-in. diameter and larger standard sizes vary up to six inches in diameter.

Major aircraft applications include cooling of electronic gear, ventilation of crew and passenger areas, window defrosting, and cooling engine oil.

Circle No. 105 on Reader Service Card.

AUTOMATIC SEXTANT

Experimental model of a new sextant capable of automatic tracking of



the sun in daytime and the stars and planets at night has been disclosed by Kollsman Instrument Corp.

First version of its new photo-electric sextant, Kollsman states, will provide data necessary for development of production models. The new device is designed to dispense with manual sighting in air navigation.

Three components of the new sextant are a tracking device, indicator

low fuel consumption

Specific fuel consumption of the Napier Eland propeller-turbine is very low indeed—0.450 lbs./e.h.p./hr. at 36,000 ft. 400 knots cruising, or 0.505 lbs./e.h.p./hr. at 20,000 ft. 350 knots cruising. This means a great deal to the operator in terms of payload, performance and direct operating cost.

more facts about the Eland

* High aerodynamic efficiency—3,000 e.h.p. in a maximum diameter of 36 inches.
* Low specific weight—0.52 lbs./e.h.p.
* Easy maintenance—independent unit construction.
* Ease of control—single lever control, with manual over-ride, guards against engine over-speeding and over-fuelling.
* Automatic temperature compensation.
* At the first attempt the Eland has recently passed a 150 hour type test rehearsal at the full 3,000 e.h.p. rating.

NAPIER Eland turbo-prop

Partners in Progress with The ENGLISH ELECTRIC Company Ltd. D. NAPIER AND SON LIMITED, LONDON, W3. CRC E11

KAISER
FLEETWINGS

FABRICATOR OF JET ENGINE COMPONENTS

Do you need jet engine components? We have the engineering ability, the production facilities and ingenuity, the experience in forming, welding and machining of high temperature alloys required to fabricate precision parts. These four units—compressor casing, bearing air seal, exhaust duct and cone assembly, inner combustion liner assembly—are good examples of the tough jobs we like to tackle and do.

On the mainline of the PRR, midway between Trenton, N.J., and Philadelphia, Pa.

FLEETWINGS DIVISION
KAISER METAL PRODUCTS, INC.
BRISTOL, PA.
IN THE HEART OF THE DELAWARE VALLEY

Circle No. 19 on Reader Service Card.

with control panel, and amplifier. The navigator simply presets estimated position of the sun on the control panel and the automatic operation takes over.

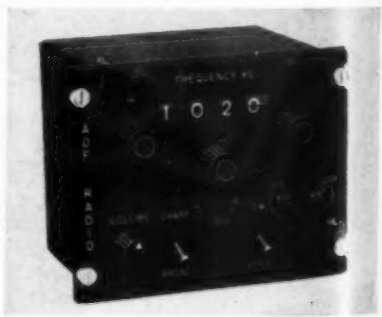
Sextant tracking device, which has a photosensitive telescope, searches for the body from which readings are to be taken. Telescope sweeps from right to left with several steps of elevation and searches an area 7-deg. wide by 5-deg. high until it automatically recognizes body to be tracked.

Circle No. 107 on Reader Service Card.

DIRECTION FINDER

New automatic direction finder developed by Lear, Inc., LearCal Div. is designed to meet CAA and military requirements as well as those set down by Aeronautical Radio, Inc. for airline use. New unit is a combination radio compass and range-communications receiver.

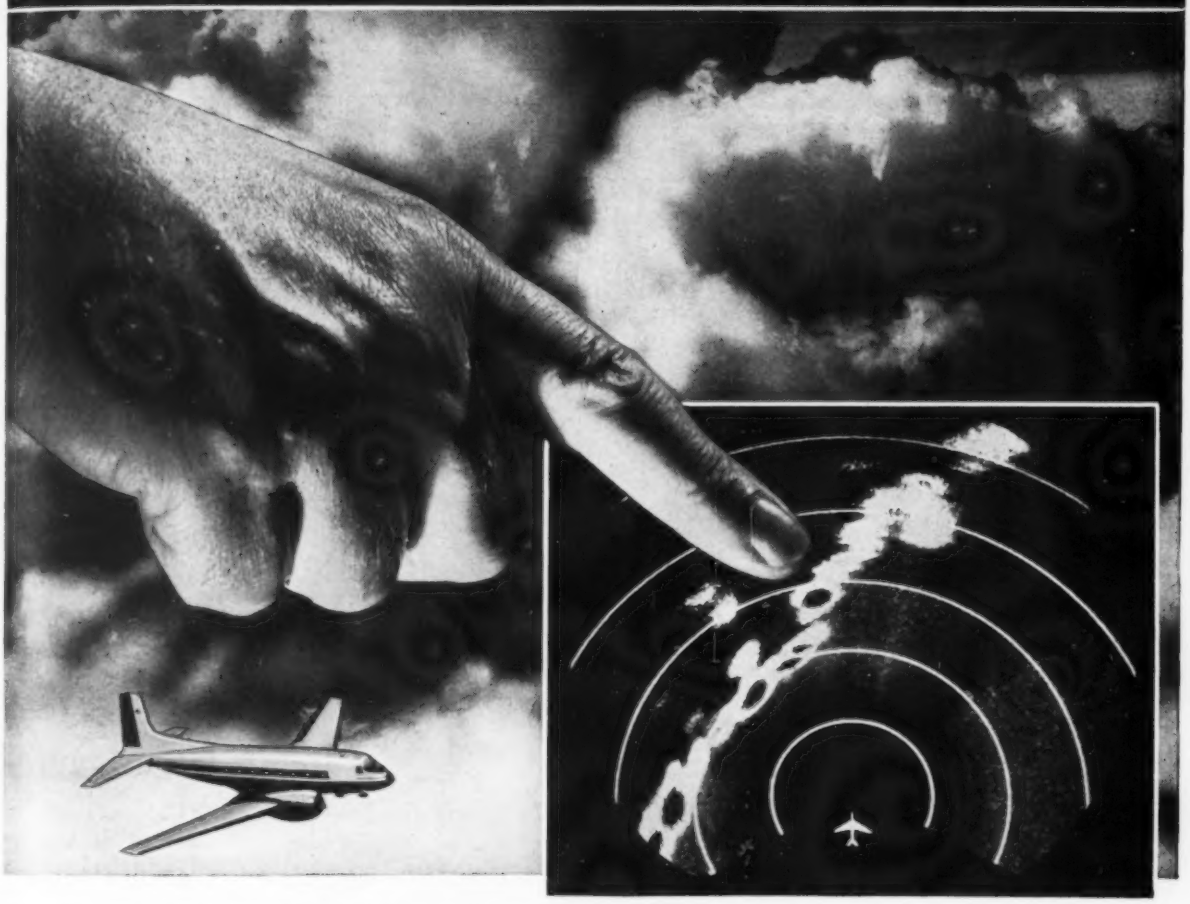
Lear ADF-16 receiver complete with shockmount weighs about 25



pounds and is packaged for ½ ATR rack mounting. A compact remote control includes a combination On-Off and function switch; tuning control and frequency indicator; and left or right loop rotation speed control. Also included are a selectivity switch, volume control and CW voice switch.

Feature of the ADF-16 is precision selection of an infinite number of chan-

BENDIX WEATHER RADAR FOR EXECUTIVE AIRCRAFT



PUTS A FINGER ON STORMS MILES AHEAD!

At the tip of the finger in the illustration above, you see an actual storm. It's on the scope of the new Bendix* Airborne Weather Radar system. This ingenious device penetrates storms as far as 150 miles ahead. It gives the pilot a complete "picture" of what's in store—even at night or under instrument conditions.

By referring to this scope, the pilot can pick a smooth path through or between storm areas. *For example: In the scope picture above, the white areas are a line of storms. Those with black centers and thin white lines represent great turbulence. The small plane (at bottom-center on the scope) shows the pilot the position of his plane in reference to the storm. It indicates that by changing course very slightly, he will find a smooth, safe route.*

In addition to greatly improving flight safety through storm areas, Bendix Airborne Radar can be used as a navigational aid and for terrain mapping. It's available on either X-band (3.2cm) or C-band (5.5 cm) frequencies. Let us show you how Bendix Weather Radar can help your operation.

For complete information, write to E. E. Baker, 8633 Loch Raven Boulevard, Baltimore 4, Md.

BENDIX RADIO DIVISION ● BALTIMORE 4, MARYLAND

West Coast Sales: 10500 Magnolia Blvd. N. Hollywood, Calif.
Export Sales: Bendix International Division 205 E. 42nd St. New York 17, N. Y., U.S.A.
Canadian Distributor: Aviation Electric, 200 Laurentian Blvd., Montreal, Quebec

Bendix AVIATION Radio

Bendix AVIATION CORPORATION

*Reg. U. S. Pat. Off.

Circle No. 20 on Reader Service Card.

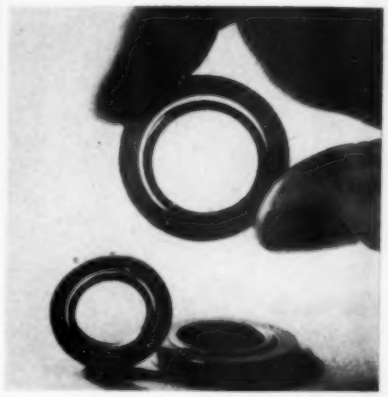
nels in the 90-1750 kc range within three seconds. Literature available.

Circle No. 111 on Reader Service Card.

PLI WASHER

Large-scale production of preload indicating washers (PLI washers), originally developed by Douglas Aircraft Co., has been announced by Standard Pressed Steel Co.

New washer, now in general use to control bolt torque at critical fuselage and wing section joints on DC-6B and DC-7 transports, provides a fool-proof means of tightening bolts to predetermined preloads as high as 80% of bolt yield strength.



Tests at SPS have shown that PLI washers lasted as much as 50 times longer under dynamic load without failure than similar bolts that were tightened to minimum preload to be expected from torquing.

PLI washers consist of two concentric steel rings, one fitting freely inside the other. Inner ring is greater in height than the outer, thus requiring a predetermined load to compress it to the height of the outer ring.

Standard Pressed Steel is now producing the washers under sole license from Douglas. A complete range of sizes is available for aircraft and industrial bolt types.

Circle No. 106 on Reader Service Card.

AIRCRAFT WIRE

New high temperature aircraft wire introduced by The Electric Auto-Lite Co. is designed specifically for jet aircraft and is said to operate satisfactorily at temperatures ranging from —80F to +400F.

Wire features a silver-plated copper conductor covered by an extrusion of silicone rubber for extreme temperature resistance. Additional coverings consist of a glass fiber braid followed by a lacquer-coated braided yarn.

New product conforms to Spec. MIL-W-8777.

Circle No. 113 on Reader Service Card.

Circle No. 21 on Reader Service Card.

TRANS-CANADA AIR LINES REPORTS:

Traffic up 55%

in the first month of Viscount service on New York-Toronto route

Wherever the Viscount flies...traffic figures rise!

This statement has been dramatically proved in actual service by enterprising airlines all over the world. One of the most recent proofs of the Viscount's prowess as a traffic builder comes from Trans-Canada Air Lines.

In their very first month of operation, TCA's latest figures show that their new turbo-prop Viscounts carried 55.5% more passengers than did their piston-engined aircraft the preceding month . . . although the April capacity was only 38.3% greater! And in the same period of time, the passenger load factor rose from 76 % to 87%.

In the 800 million passenger miles that Vickers Viscounts have flown throughout the world, they have consistently demonstrated an ability to reduce operating costs and increase load factors and profits.

The passenger appeal of Viscounts is unequalled in the annals of commercial aviation. They are faster, and have reduced flight times on major air routes by as much as 30%. They are more comfortable. Remarkably free from vibration and engine noise, the Viscount permits travelers to converse, rest, read or sleep with a new degree of ease and relaxation.

Behind the Viscount stands the great name and service organization of the Vickers Group—internationally famous as the makers of ships, industrial machinery, heavy tractors and precision equipment.

VICKERS

VISCOUNT

built by VICKERS-ARMSTRONGS
powered by ROLLS-ROYCE

VICKERS-ARMSTRONGS LIMITED
(Aircraft Dwision) Weybridge, England

United States Representative: Christopher Clarkson, 10 Rockefeller Plaza, New York 20, N. Y.

TACAN A

will revolutionize

Amazing New IT&T development

...ze aircraft navigation

Gives position of aircraft instantly, automatically, and with accuracy never before attained

TACAN (tactical air navigation) provides both distance and bearing information in a single "package" about the size of an ordinary shoe kit. This has never been done before!

By integration of functions, and miniaturization into one small unit, TACAN represents a giant stride in aircraft navigation equipment. Add extreme accuracy, and adaptability to varying installation conditions such as on shipboard or for mobile land equipment, and you know why TACAN is described by military and civil aviation officials as one of the most significant advances in many years.

TACAN is the result of a series of development programs sponsored by the U. S. Navy and the U. S. Air Force at Federal Telecommunication Laboratories, a division of IT&T. It is another of the outstanding IT&T research and engineering "firsts," and major contributions to safer, more dependable flying.

A light, simple, comprehensive TACAN *airborne unit can be made available for private flying.*

INTERNATIONAL TEL and TEL

IT&T

INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION
67 Broad Street, New York 4, N. Y.

Circle No. 22 on Reader Service Card.

INTERNATIONAL

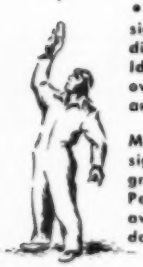
37mm PISTOL FLARES and SIGNALS

Three different types of flares and signals are interchangeably used with the 37mm pistol.

• The 1-minute parachute flare generates more than 75,000 candle-power of light for over a minute. Plenty of time and light for forced landings or observation.

• Meteor signal is ideal for marking a position. Reaches a height of 200 feet.

• The red parachute signal has been seen at distances of 36 miles. Ideal for planes flying over water or isolated areas.



Meteor and parachute signals furnished in red, green, yellow and white. Parachute signal also available in smoke for daytime use.

Write FOR DESCRIPTIVE LITERATURE

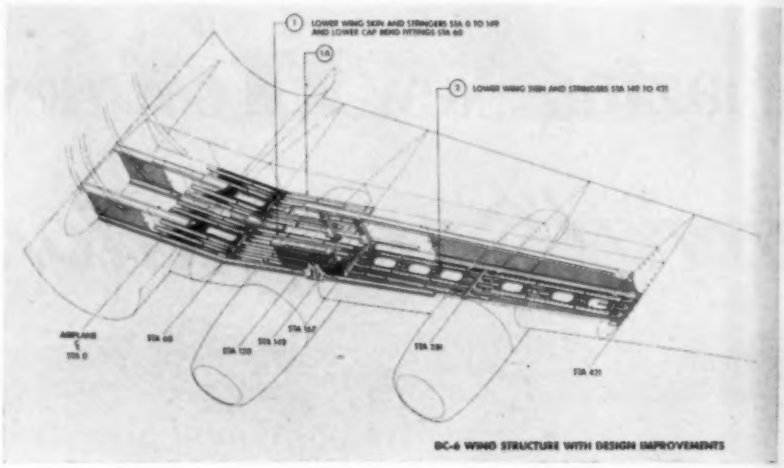
- 1-minute; 1½-minute and 3-minute electrically operated parachute flares
- 1-minute pistol operated parachute flares
- 3-minute manually operated parachute flares
- Signaling ammunition
- Aviation Flare pistols and signals

KILGORE, INC.

International Flare-Signal Div.

Westerville, Ohio

Maintenance Bulletin Board



ENGINEERING DIAGRAM shows DC-6 lower center wing structure incorporating design improvements from later DC-6B and DC-7 models. Douglas is recommending change on first 152 planes for longer service life, lower maintenance costs and better operating weights.

New Douglas Modification Cuts DC-6 Maintenance

Douglas Aircraft Co.'s Santa Monica division service department has developed a lower center wing structure replacement program for earlier type DC-6s which it has recommended to airlines operating the equipment.

Proposed for the first 152 aircraft in the DC-6 series, the rework embodies a retrofit with later type DC-6B and DC-7 series wing skin and stringer structure, plus flap supporting structure of improved design.

In addition to the structural "beef-up," the center wing modification will accomplish substantial maintenance economies and provide weight benefits for operators. Zero fuel weight can be upped from 72,000 to 74,000 pounds and landing weight from 78,000 to 80,000 pounds. Increase in aircraft weight is only 182 pounds.

Over 20,000 Hours

DC-6s have now been in service for more than eight years and all of the first 152 aircraft are believed to have passed the 10,000-hour mark in accumulated flight time. A recent capitulation showed that 88 had exceeded 20,000 hours.

Service experience and rework and repair of local areas has demonstrated that improvement could be realized in several wing structural regions by taking advantage of materials and fittings of improved design similar to those used in the later DC-6B and DC-7 aircraft.

W. C. Winkler, Santa Monica division service manager, says Douglas also feels it would be more economical to replace the lower wing skin, doublers, and stringers all at one time—utilizing the latest designed parts—than to make repairs piecemeal at unpredicted intervals.

He adds, however, that Douglas has set no definite time at which it recommends making the replacement. The change is entirely optional to airlines and can be made in full or in part.

Domestic airlines operating early-type DC-6s include American, United, Braniff, Delta-C&S, and National. International carriers are Panagra, CMA, Sabena, SAS, KLM, Trans Caribbean, Australian National and Tasman Empire.

First complete replacement may be made by ANA in two DC-6s purchased from National American is setting up a facility at Tulsa where it plans to do the rework on its entire DC-6 fleet.

Originally, Douglas proposed to establish a facility at its new Tucson, Ariz. flight base to handle the project but decided later to supply kits with which the carriers could accomplish their own modifications.

These modifications, being extensive, will entail a substantial number of man-hours. Estimates on the total cost per aircraft vary, but generally are about $90,000.

New assemblies recommended by Douglas are:

• **Lower wing skin** and stringer panel assemblies between front and rear spars across the airplane from one inboard nacelle to the other. Improvements in this area include continuous skin across the fuselage box beam compartment and station 60, and larger fittings on the lower spar caps at station 60 to provide a longer area of support and load distribution.

• **Lower wing skin** and stringer panel assemblies between front and center spars extending from each inboard nacelle to the outer wing joint at station 421. These panels include new access door doublers as well as the latest type stringers, and provide new material in the exhaust area path.

Added modifications to increase the operational weights include strengthening of a number of attachments in the affected area.

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A-MP Tests New Taper Pin Connectors

A relatively old device, the taper pin fastener, is helping to solve some critical wiring problems in high-speed manned and unmanned military aircraft, as well as civilian aircraft. Moreover, in an unusual reversal of procedure, a "user" committee of representatives from Douglas, Lockheed, North American, Northrop and Convair, has evolved and supervised the qualification tests of taper pin fasteners, during recent weeks, in collaboration with the manufacturer, Aircraft-Marine Products, Inc., at its laboratory in Harrisburg, Pa. The traditional method has been for the manufacturer to come up with the hardware and try to sell the user.

As developed by A-MP, the taper pin fastener, crimped by a special machine onto the end of an electrical circuit wire, is inserted by a plier-like impact tool into a mating connector socket. Not only is considerable force required to remove the taper pin but also its extremely high contact pressure assures both excellent electrical and mechanical stability characteristics.

The five-man committee subjected the taper pin to pull out, electrical, heat, corrosive and vibratory tests far more severe than it would be expected to encounter in either military or civilian service and, according to informal opinion, it passed all the tests with flying colors. The committee is due to report out the results of its tests in several weeks and there is small doubt that they will be highly favorable.

The taper pin could readily pass CAA tests for use aboard civilian aircraft and, once the report was submitted to the government agency, an airframe manufacturer could apply for permission to use it. The pin has been approved for use in circuits aboard the Martin Matador, Northrop's Radioplane and Chance Vought's Regulus missile. Martin, which had connector problems in its Matador, found increased reliability in its circuitry through the use of taper pin fasteners.

A-MP got into the taper pin fastener not only through the Martin problem but also as the need arose among its airframe customers to squeeze more and more electrical circuits into less and less space, especially under the miniaturization requirements of guided missiles and unmanned aircraft. It discarded soldered connections for several reasons: wires broke at soldered points, and solder is unreliable in areas of high ambient temperatures aboard supersonic aircraft and missiles. Moreover, in a bundle of hundreds of circuits in a cable smaller than a broomstick working space problems are critical and the electrical reliability of soldered circuits is low and difficult to check.

Taper pins save about 30% in the weight of electrical harnesses in an aircraft as compared with soldered connections. A-MP is now considering a further reduction in weight by the elimination of connectors and is devising a method whereby electrical components may be hooked up directly by taper pins without the necessity for connector sockets.

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★ **Herman Heise,** Eclipse-Pioneer Div., Bendix Aviation Corp. Supervisor, experimental mechanical laboratory, Teterboro, N. J. (30 years).

★ **Michael Kost,** Glenn L. Martin Co. Conference leader, international relations div., Baltimore.

● **E. A. Carlson,** American Airlines. Foreman, ground equipment, La Guardia.

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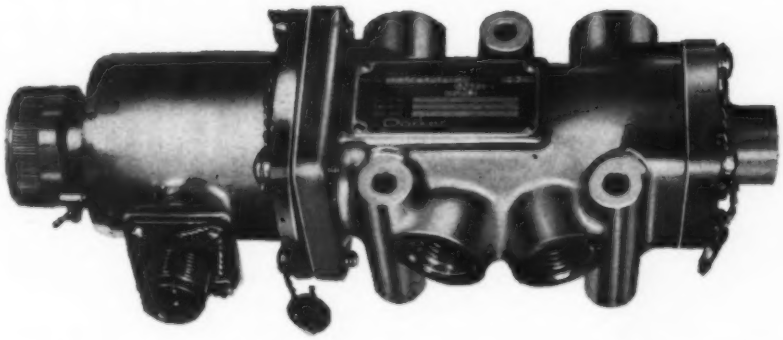

When Lockheed Aircraft engineers called Parker, they wanted action: Lockheed had designed a new hydraulic system to give more positive control over the power operated elevator trim tabs on the P2V-Neptune. As a result of the new design they had a requirement for a 4-port valve which was not available from any supplier.

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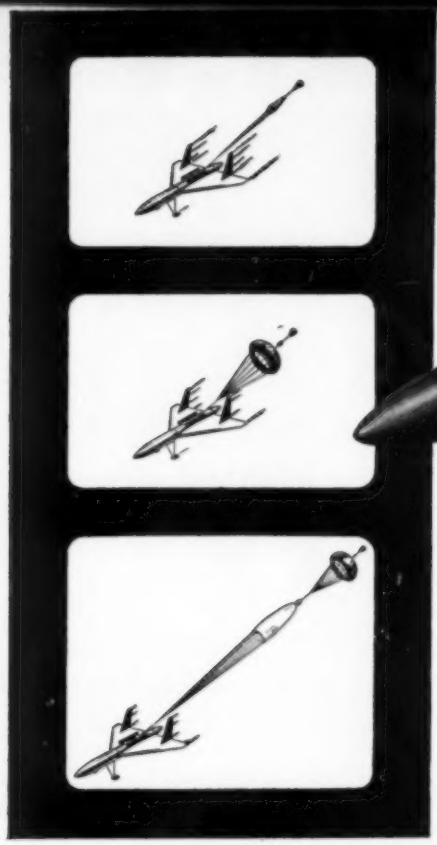

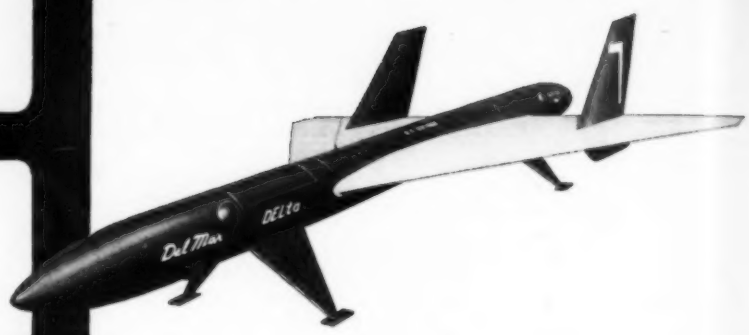

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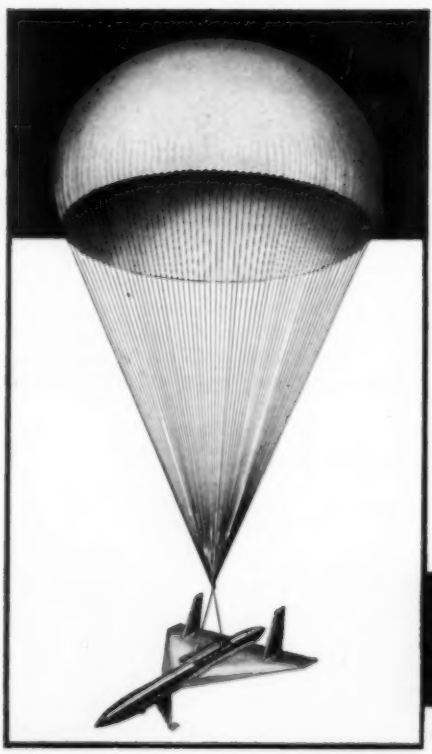

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Technical Literature

AIRCRAFT FABRICATION. Facilities of Lavelle Aircraft Corp. in manufacture of airframe assemblies, jet engine components and allied services are detailed in new 6-page folder.

Circle No. 161 on Reader Service Card.

NEW CONNECTORS. New 14-page booklet describes Taper Pins, Taper Tab Receptacles and Taper Bloks developed by Aircraft-Marine Products, Inc.

Circle No. 150 on Reader Service Card.

GLASS FABRIC. Complete specifications on new high-modulus glass fabric are outlined in brochure available from Textiglass, Division of Cheney Brothers.

Circle No. 151 on Reader Service Card.

DATA REPEATERS. New folder published by AC Spark Plug Div. General Motors Corp. lists performance information on data repeaters for flight indication or recording.

Circle No. 152 on Reader Service Card.

AIRCRAFT PRODUCTS. New 20-page booklet available from The Goodyear Tire & Rubber Co. illustrates the developments of its Aviation Products Division.

Circle No. 153 on Reader Service Card.

THERMAL BARRIER. Nine technical papers surveyed from December, 1954, symposium of American Society of Mechanical Engineers on "Problems of the Thermal Barrier" are reprinted in new 12-page booklet. Request from Office of Information Services, New York Univ., University Heights, New York 53, N. Y.

INVESTMENT CASTINGS. Surface Combustion Corp. has issued Bulletin SC-170 discussing use of gas-fired furnaces for precision investment casting.

Circle No. 154 on Reader Service Card.

CASTING FACILITIES. Services, scope of operation and casting work available from Springfield Bronze and Aluminum Co. are described in new folder.

Circle No. 155 on Reader Service Card.

MAGNETIC INSPECTION. North American Philips Co., Inc. has prepared an 8-page question and answer booklet on magnetic particle testing.

Circle No. 156 on Reader Service Card.

FELT PRODUCTS. New 24-page technical brochure covering use of felt in aircraft design and other industrial applications is available from The Felters Co.

Circle No. 157 on Reader Service Card.

PLANT LAYOUT. 50-page catalog containing 5,000-item list of three-dimensional stock models for plant layout work is being distributed by Visual Plant Layouts, Inc.

Circle No. 158 on Reader Service Card.

SHOCK/VIBRATION DATA. Summary of shock and vibration requirements of military specifications has been compiled by Barry Controls, Inc. in new Bulletin 804A.

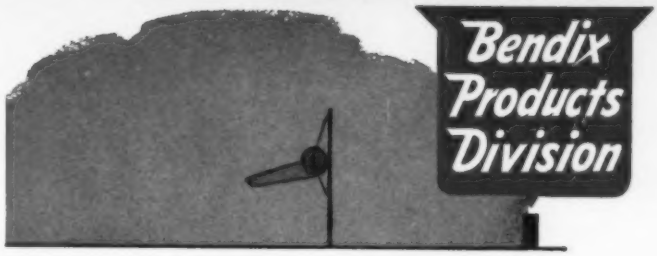
Circle No. 159 on Reader Service Card.

POTENTIOMETERS. New potentiometers available from Vari-ohm Corp. are illustrated in Bulletin V321.

Circle No. 160 on Reader Service Card.

VIBRATION CONTROL. Complete line of mounting bases, vibration and shock controls produced by T. R. Finn & Co. are illustrated in Catalog AB-35.

Circle No. 162 on Reader Service Card.



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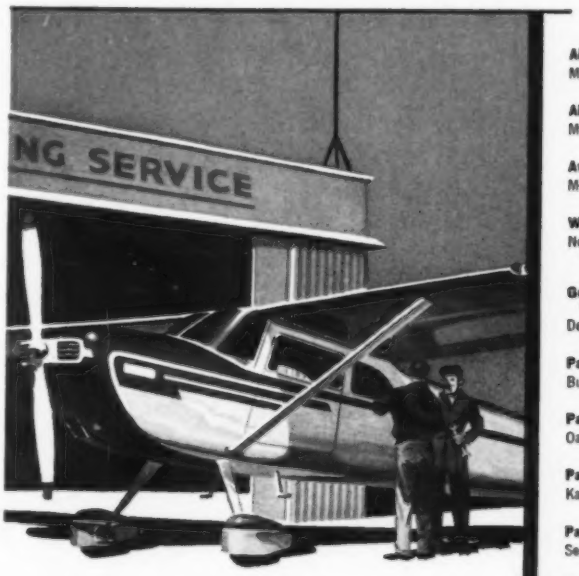

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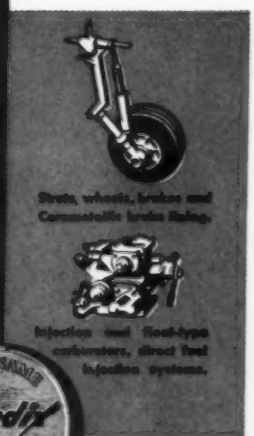
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West Coast Talk . . . By Fred S. Hunter

- **Acceleration of Navy's R7V-2 turboprop 'terrific'**
- **Lockheed test pilot sees no training problems**
- **Stability, control no different from other planes**

HOW does flying the turboprop R7V-2 differ from flying a piston-powered Super Constellation? Not so much as you might think, says Ray Meskiman, Lockheed engineering test pilot on the experimental Navy transport.

Principally, the new turboprop pilot has to get used to the greater response of the turbine power. "The R7V-2 accelerates like nothing we've ever had before," says Meskiman. "Open one of these up and things start to happen."

But stability and control are no different from other propeller-driven planes. A couple of times around the field will give an experienced multi-engine pilot the hang of flying turboprops of high power, Meskiman feels. Airlines won't have to worry about special training measures.

* *

Test Pilot Meskiman has no trouble qualifying as an authority on the whys and wherefores of any kind of aircraft you can name, except, maybe, helicopters. He speaks familiarly of Canucks and OX5 Lairds and Boeing 40Bs and other early-day aircraft. He even qualified, at one time, on flying boats and flew Catalinas for Consolidated Aircraft in San Diego. He was an air mail pilot in Chicago in the 20's and subsequently flew for United Air Lines for 11½ years. He's logged more than 16,000 hours in a flying career that has stretched over more than 35 years, since 1919, when he taught himself to fly. Now, at 57, when he could be coasting toward retirement, he's testing new-type experimental and prototype planes. "I like anything new," he explains.

* *

Jets, they say, are for the kids. Kids like Meskiman. In his 50's, he flew nothing but jets for five years. He was a production test pilot on Lockheed's F-80As and F-94As and Bs. Matter of fact, at one point, before high jet times became so general in the Air Force, it was calculated that Meskiman actually had more jet time than any other pilot flying.

* *

Meskiman has been a test pilot for Lockheed since 1941. In Rudy Thoren's engineering flight test section, he's one of an illustrious group in his association with such stars as Tony LeVier, Herman Salmon, Stan Beltz and Roy Wimmer. He specializes in the big planes now. Currently he is assigned to the Navy R7V-2 and its Air Force counterpart, the RC-121F, but he has also flown the YC-130 and thus is acquainted with both P&W and Allison versions of turboprop power. When it comes to comparing turboprops against turbojets for transports of the future, Meskiman is strictly neutral. "They'll both be wonderful," says the man who "likes anything new."

* *

Capt. Eddie Rickenbacker, a hot jet prospect, was lunching with Lockheed executives in the dining room at Lockheed Air Terminal recently when, by coincidence, Roy Wimmer came whishing past with a YC-130 from Palmdale. Coincidence?

* *

Sales on the Tony LeVier book, "Pilot," have passed 10,000 copies . . . Paul Mantz has fixed up three World War I Jennies, one World War I de Havilland and one Ryan B-1 for use in the movie, "The Lindbergh Story" . . . Look for American Airlines to launch DC-7 coach service with its spring schedule changes in 1956, if not before. Probable seating configuration, 94 passengers.

* *

The industry will miss John Myers who, after 13 years, has resigned from Northrop Aircraft to devote his time to his oil interests . . . Atomic Energy Commission records show that H. S. Greenleaf, senior controller at the CAA's Salt Lake City Center, is the only person, including the commission's own personnel, who witnessed every one of the tests at Mercury, Nev. . . . Choral group at Douglas is called the "Gleemasters."

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Circle No. 29 on Reader Service Card.

International Aviation

By Anthony Vandyk

Scandinavian Airlines System is finding the ancient adage that imitation is the sincerest form of flattery to be true as far as its "polar" route is concerned. When SAS pioneered the northern link between Europe and the west coast of the U. S. last November, the doubting Thomases were numerous. Dire predictions were made that there was insufficient traffic to support the route; that people traveling between the Coast and Europe wanted to break their journey in New York; that the time saving was insufficient to compensate for the boredom of 24 hours in the same aircraft.

The Cassandras soon had to change their tune, for SAS made a commercial success of the "polar" route flight from the start. The winter traffic results were so encouraging that frequency was stepped up from two to three flights weekly this spring and, even so, the service is almost sold out for the summer season.

The success of the SAS operation was quickly noticed by the airline's competitors, and the result of their observation is becoming apparent. This month Canadian Pacific Airlines started its "polar" route from Vancouver to Amsterdam, with immediate through westbound connections to Japan, New Zealand and Australia.

Last month Pan American World Airways applied for "polar" routes from the West Coast to Oslo, London and Paris. (This would give PAA a true round-the-world route—see this column March 28, 1955.) Shortly after this action the U. S. and British governments agreed to the establishment of a "polar" route between the two countries: The American carrier designated to fly the route will have San Francisco and Seattle as co-terminals; the designated British carrier (Presumably BOAC) will have as its U. S. co-terminals San Francisco and Los Angeles.

These developments are likely to be the first of many. The West Coast has suddenly become a focal point for international air service — a Junction for routes linking the U. S. with Europe, Latin America, the Orient and Australasia. Interested parties include such diverse carriers as Air France, BOAC, Japan Air Lines, KLM, Northwest, PAA, Qantas Empire Airways, TCA, and TWA—quite apart from U. S. domestic operators who stand to lose transcontinental traffic from a wholesale diversion of West Coast-Europe traffic to the "polar" route. SAS and CPA are but the first of many.

British Air Influence In Middle East Rises

Mideast Aircraft Service Co., to be known as MASCO, with headquarters at Beirut, Lebanon, has been formed jointly by British Overseas Airways Corp. and British independent Hunting-Clan Air Transport, Ltd. Skyways, another British independent, also is expected to join the set-up, which was formulated at a recent conference in Beirut, with BOAC Board Chairman Sir Miles Thomas presiding.

Primary function of MASCO is to introduce modern British airline equipment and methods into the Middle East sphere, which has a rich revenue source in the oil companies and their staffs. The new firm says it will establish a pool of Vickers Viscounts, including the three scheduled for delivery to Hunting-Clan this year, which it will make available to local airlines on favorable terms.

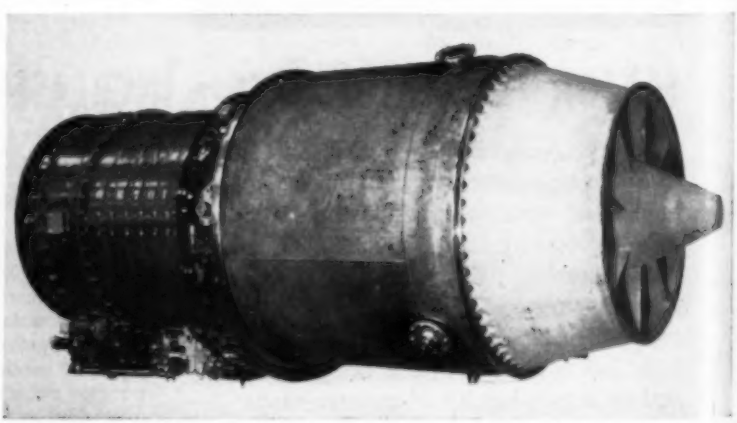
The several small airlines in this area (Middle East Airways, Aden Airways, Arab Airways, Cyprus Airways, etc.) lack capital to buy these million-dollar transports, and MASCO probably will make them available on lease or pay-as-you-go terms. The new company is also to operate as a maintenance center for all BOAC's associate airlines in this area, and the Hunting group company Field Aircraft Servicing, Ltd., is already working with BOAC technicians to set up the base and train locally recruited personnel.

Significance of MASCO lies in the close co-operation between state-owned BOAC and the independents. Although plans had been laid for some time. Sir Miles Thomas acted only after the British general election returned the Conservatives to power, thus confirming the status quo for another five years.

BOAC recently bought out Pan American World Airway's holding in Middle East Airways, another key factor in establishing the new company. Cyprus Airways, in which British European Airways Corp. took over the major interest from BOAC sometime ago, seems to be left out of the present negotiations.

It is not clear how the establishment of a Viscount pool will affect BOAC's plans to retire its Canadair Argonaut (North Star) fleet, which was slated to be made available to associate companies at favorable prices. It may be that MASCO will handle these aircraft also, dealing with the Rolls-Royce Merlin engines and pressurization equipment unfamiliar to the local airlines accustomed to DC-3s.

Recently BOAC gave figures for the Argonaut fleet revealing 3,000-hour utilization, so these airplanes backed by BOAC servicing technique should give the small airlines new, trouble-free equipment; even if not equal to Viscount or Convair 340 in comfort and performance, they still represent a big advance over the DC-3 and also offer increased capacity.



THE BRISTOL ORPHEUS, lightweight turbojet, power unit for the Folland Gnat, the Fiat G 91, the Breguet Taon, the Dassault Mystere 26, and other light fighter aircraft, has successfully completed a 150-hour type test; this initial version of the engine achieved a thrust of 3,285 pounds during the type test, but other versions under development for the production of Gnat and other aircraft are already running at higher powers. On the basis of the type-test rating, the thrust/weight ratio of the Orpheus is very high—4.4 lb. thrust per lb. engine weight.

PRIVATE and business planes lined up at Reading Airport during conference.

Industry, Government Experts Address 800 at Reading Meeting

By LOIS C. PHILMUS

Reading, Pa.—More than 300 aircraft brought nearly 800 business and private pilots and industry representatives to the Reading Aviation Maintenance and Operations meeting at Reading Municipal Airport this month. What began six years ago as a relatively minor local gathering has grown to national importance.

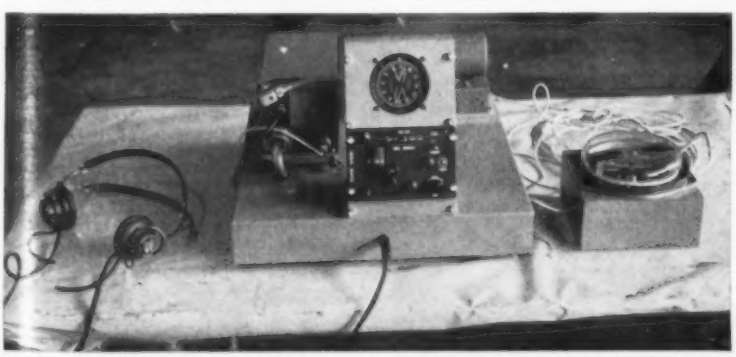
The all-day meeting was conceived and is sponsored by Reading Aviation Service President A. M. "Sime" Bertolet. The session provides registrants with a technical conference featuring industry and government experts on new equipment, procedures and operational data. Growing industry support is evidenced by the increasing number of exhibits. Static exhibits were provided by such concerns as Bendix, Lear, Radio Corporation of America, Collins, U.S. Coast and Geodetic Survey, Reading Batteries, and many others.

New aircraft were on display throughout the day, including such new models as the Meyer twin-engine small transport. One of the highlights was the fly-in of six Cessna Model 310s in close formation.

One of the newest and most popular features of the meeting was presentation of the Reading Aviation Awards for high standards of excellence in industrial, executive and private aircraft.

Cash, trophies and plaques were awarded to 12 pilots whose aircraft were adjudged best in each of four categories and three weight classes.

The Sun Oil Company DC-3 won the best of class for twin-engine aircraft of more than 12,000 lbs. and therefore was designated Flagship of the Industrial Fleet for 1955. Capt. Ray Higgins, pilot, accepted the award and walked off with a second prize for the best aircraft exterior in its weight class. Other awards were made for best exterior, best interior best equipment and pres-



NEW AUTOMATIC direction finder is being readied for the market around the first of the year, AMERICAN AVIATION has learned. Aircraft Radio Corporation of Boonton, N. J., is developing a three-band ADF with a dynamotor which supplies both a-c and d-c current. It is understood that ARC is currently building several prototypes for field tests. The complete unit reportedly weighs about 20 pounds. No price has yet been mentioned.

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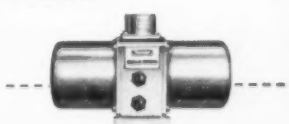
Giannini low pressure transmitters utilize a precision potentiometer element to translate pressure signals into proportional electrical signals (20-50 volts), requiring little or no amplification.

MODEL 45176

Models are available with single or multiple outputs, and can be linear with airspeed, altitude, pressure, or to natural or empirical functions.

Ranges from ±0.5 psi., diff. to 0-150 psi., (abs., diff., gage), under normal environmental conditions, or extreme conditions of high acceleration, severe shock or vibration. Write for complete engineering information.



MODEL 45177

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AIRBORNE INSTRUMENT DIVISION
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Young in Heart

MOODBEAMS #6

Shirlene Long (19, 5'7", 125 lbs., brown hair, blue eyes) is young, vibrant, and healthy—with a long and happy life expectancy. This is our first try at comparing a beautiful girl with an aircraft spark plug, but, in being Young In Heart, Shirlene and AC have something in common. AC Spark Plugs — close to your engine's heart — give positive Extra Performance. They have at least TWICE THE LIFE EXPECTANCY of ordinary spark plugs, proved by airlines and the military services. To make your business aircraft engines YOUNG IN HEART, insist on AC! We are proud to be distributor for the AC Spark Plug Division, General Motors Corp.

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Business Flying

entation, and best of class for single-engine, multi-engine over 12,000 lbs., and multi-engine under 12,000 lbs. categories.

• **Radar** was the featured topic of the day, with presentations made by CAA and industry spokesmen.

Bert Moore, Senior Planning Officer of CAA's Airways System Planning Staff, revealed that CAA is trying to get together with the Air Defense Command for joint use of some of its radar, similar to the programs being developed with the Navy and Air Force. He told the group that ADC now provides emergency service to all aircraft by monitoring 121.5 mc. He strongly cautioned against the misuse of the radar facilities, however. He noted that non-instrument pilots cannot possibly use radar to its full advantage and could well interfere with instrument traffic.

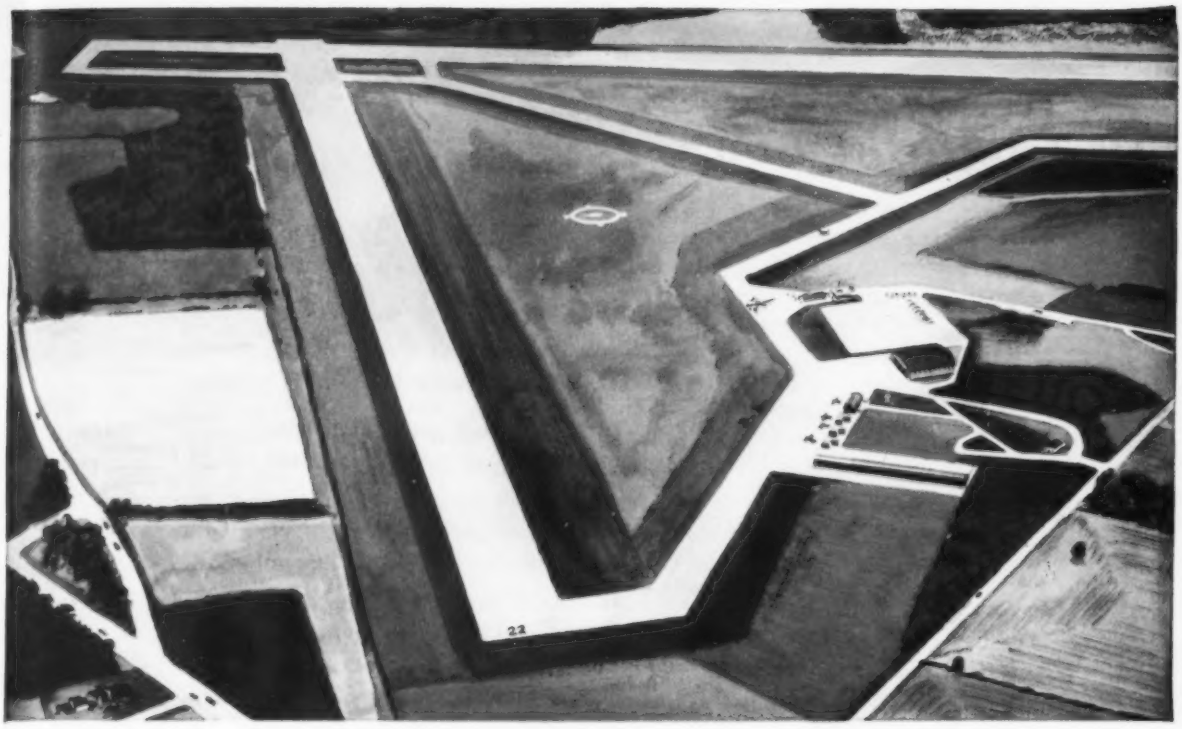
John Whitehead of RCA and Gene Baker of Bendix Radio discussed airborne radar equipment. Radar was recommended for business aircraft of the Lodestar and DC-3 class, but it was pointed out that installation in anything smaller would result in too severe weight and power penalties.

• **A passenger relations booklet** was one of the most discussed objects at the meeting, aside from the program itself. Printed for its passengers, it is placed on the seats of aircraft owned by the American Sterilizer Corporation of Erie, Penna. The booklet was prepared by the aviation department. In simple laymen's language, it describes the Bonanza and its characteristics, the purpose of each piece of radio and instrumentation, gives a description and the purpose of each maneuver, and concludes with a professional biography of the pilot. • • •

Business Aircraft Ass'n To Hold Forum Oct. 5-7

The theme of the National Business Aircraft Association annual forum in Detroit, October 5-7, will be "A.M.-O."—Administration, Maintenance and Operation, Jean H. DuBuque, executive director, has announced. The meeting has been reorganized to devote maximum time to panel-type discussions. Panels of experts will be smaller to allow more time for questions from the floor and speeches will be kept to a minimum.

With an announced aim of "maximum margin of safety, efficiency and economy," the meeting will feature discussions on how to reduce pressure on pilots, budget problems and executive attitudes.



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CF-100's in formation on winter patrol over Canada's Northern approaches.

. . . *in England now*

Three CF-100 all-weather interceptors recently flew the Atlantic and are now on evaluation tests with the R.A.F. in England.

In that swift crossing, Avro Aircraft reversed the trend of aeronautical development to place at the disposal of the R.A.F. the world's outstanding all-weather interceptor.

Additional evidence of the serviceability and performance of the CF-100 is its unanimous selection to equip by 1956, four R.C.A.F. squadrons to strengthen the all-weather defence capabilities of NATO in Western Europe.

Avro Aircraft, as one of the main industrial arms of the R.C.A.F., is constantly at work reinforcing and maintaining the air defence of the free world.

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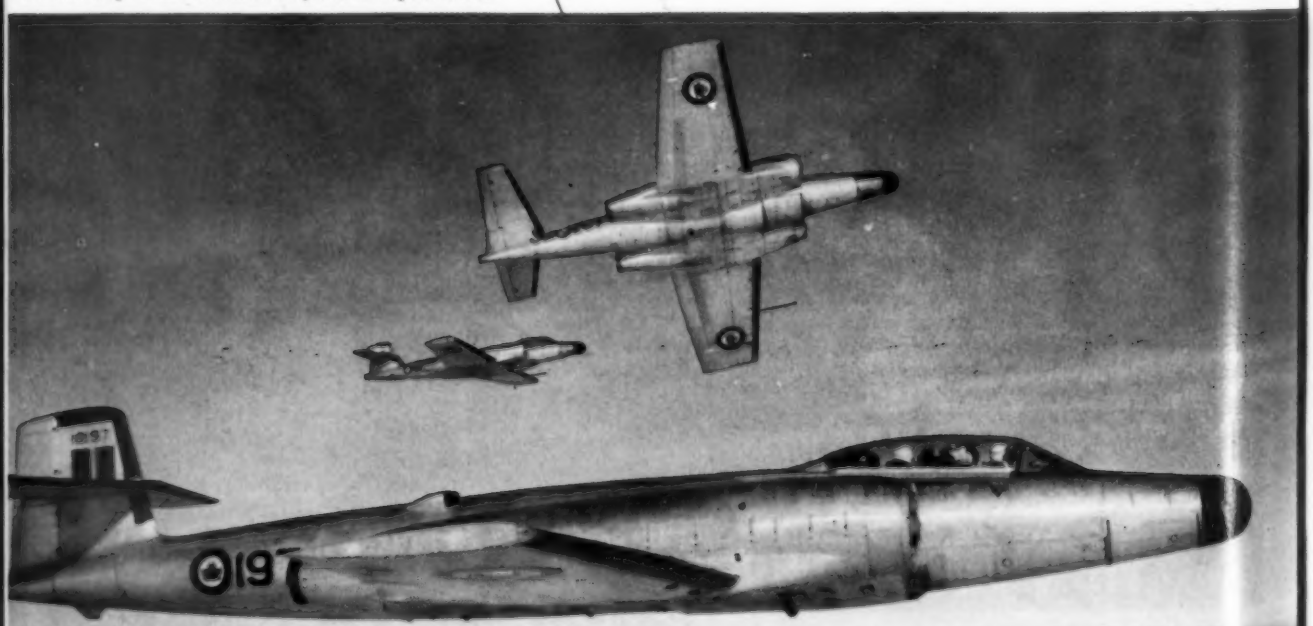
A. V. ROE CANADA LTD.—MEMBER, HAWKER SIDDELEY GROUP

Three CF-100's flew the Atlantic in March and four R.C.A.F. squadrons will be on duty over Europe in 1956.



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TRANSPORT TRENDS

Washington, D. C., June 20, 1955

SALES BATTLE BETWEEN Lockheed and Douglas already has started in Europe. Lockheed is circulating a document claiming that the 1649A will make the London-New York nonstop "five hours faster than present schedules and up to almost three hours faster than the DC-7 when it goes into service."

Douglas, meanwhile, is losing no time on this side of the Atlantic pushing sale of its newly announced DC-8 jet. First call last week was at United Air Lines' in Chicago, with American, Pan American and Eastern visits following in quick succession.

Feeling persists, however, that Douglas decision to build was not made without a firm order in hand. Most talked of customer for the DC-8 abroad is KLM, and a commitment for the Douglas jet may already have been placed by that airline. (See page 21.)

LOOK FOR A CHANGE IN HEART within CAB toward purchase and operation of post-war twin-engine aircraft by local service carriers. Gradual switch in policy will be spurred by introduction of turboprop aircraft by trunk airlines creating a major market for displaced Convairs and Martins. Drive within the Board to cut feeder subsidies by grant of better traffic points will help justify the change in equipment.

REPORTS THAT REPUBLIC AVIATION has concluded arrangements for U. S. production of the French Caravelle jet transport (see page 73) have been denied by Republic president Mundy Peale. Peale indicated, however, that he is "very interested" in the SNCA du Sud-Est model and wants to look over the flight performance data as soon as it is available.

MILITARY WILL NOT INTERFERE with commercial jet program when need for engines arises, according to informed sources. Announcement of Douglas DC-8 would not have been made, these sources say, unless there had been tacit arrangement with Defense Department concerning future supply of engines.

Besides, U. S. Air Force is said to be anxious to bring jet engines into commercial use for sound, practical reasons. Commercial lines are expected to introduce maintenance economies, find ways to reduce fuel consumption and lengthen time between engine overhauls.

RELATIONSHIP BETWEEN TRAVEL AGENTS AND AIRLINES are "satisfactory but not outstanding" because of lack of understanding on both sides, a survey made for the American Society of Travel Agents indicates. Survey, conducted by Cresap, McCormick and Paget, management consultants, revealed "lack of complete understanding of role of travel agents in marketing of travel and lack of mature understanding of principal agency relationship."

Many carriers feel agents do not perform a sufficiently aggressive sales or merchandising job. Some carriers, notably domestics, resent what they consider "interception" of commercial business that they believe should be coming to them directly. Agents, on other hand, feel they need higher rates of commission. Total of 1,006 ASTA agents account for between $450 million and $500 million gross volume annually.

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French Twin-Jet Bids for Airliner Market

By ANTHONY VANDYK

MAY 27 was a big day for French aviation. It was the date of the first flight of what may well prove to be France's most important transport aircraft—the twin-jet Caravelle. The jet airliner represents a new bid by the French to compete on the international market which it already is penetrating with military planes.

The Caravelle is off to a good start. It made its initial flight at the time scheduled by its manufacturer, SNCA du Sud-Est, and preliminary reports indicate that its handling and performance are fully up to expectations. A lengthy test program is now before the Caravelle and it will not be until this is completed that the commercial prospects for the plane can be assessed.

The unusual configuration of the Caravelle, with its engines in pods at the rear of the fuselage, already have commanded considerable interest in the aircraft. SNCASE points out that this arrangement has numerous advantages:

• **Aerodynamically,** elimination of the engines from the wing area gives an exceptionally clean wing and a larger flap area provides more lift. The thrust line is close to the center of gravity and therefore variations in power have little effect on longitudinal or lateral stability (failure of one engine, for example, would not cause any great asymmetrical effects). Moreover, location of the powerplant alongside the fuselage is advantageous when reverse thrust is available for the engines.

FRANCE'S CARAVELLE jet transport made its first flight May 27.

• **Passenger comfort** is enhanced by a considerable reduction of noise and vibration in the cabin since the passenger compartment is located entirely forward of the jet intakes.

• **Safety is greater** in the case of an emergency landing with the gear retracted because the fire hazard is reduced due to the remoteness of the engines from the fuel tanks (they are located in the wings). Another safety angle: with the unusual engine locations there is less danger in the case of turbine blade failure. Because of their position, the air intakes are well clear of grit and stones thrown up during takeoff.

Operationally the Caravelle's configuration offers numerous advantages:

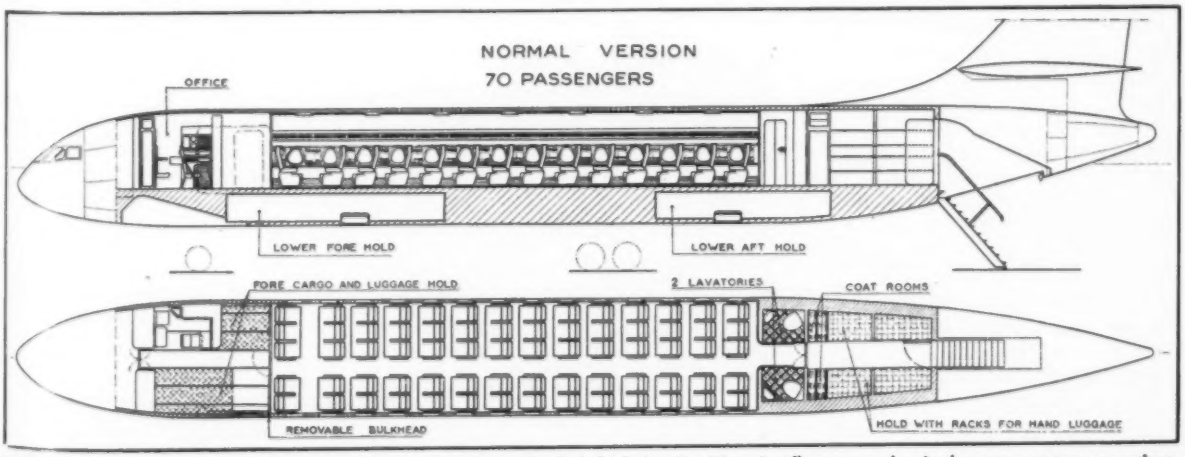
• Distance of only seven feet from the ground to the floor of the cabin.

• Easy refueling due to the four pressure refueling points being under the wings less than 6½ feet from the ground; checking of the fuel is performed with "dripsticks."

• Free access to the forward double freight door (6½ ft. wide and 5 ft. 11 in. high) while pre-flight preparations are in progress; no congestion of traffic and maintenance personnel near the nose.

• The accessories are grouped in a bay aft of the pressure cabin on a level with the engines and directly accessible from the retractable integral stairway located on the underside of the rear portion of the cabin.

• Easy maintenance and removal of the engines; no ladders are required.



70-PASSENGER configuration will be standard for the Caravelle, but high-density 91-seat, all-cargo and mixed cargo-passenger versions will also be available.

These advantages make the Caravelle suitable for medium-stage routes where fast turnarounds are required. The aircraft was designed to a French government specification that clearly was based on the requirements for operation between Paris and French North Africa, the "milk run" on which Air France and the various French independent airlines compete. It could easily make two round trips daily over any of these trans-Mediterranean routes with a utilization of about ten hours.

• **Because the movement** of cargo between France and North Africa is so important, a special all-cargo version of the Caravelle as well as mixed cargo-passenger configurations will be available. The normal version of the aircraft accommodates 70 passengers and their baggage (a total of 15,400 lbs.) plus 5,500 lbs. of cargo. A high-density version accommodates 91 passengers and their baggage (a total of 20,020 lbs.) plus 880 lbs. of cargo.

Performance of the Caravelle, based on the use of two Rolls-Royce Avons RA16s of 10,000 lbs. static thrust each is impressive. Nonetheless, it is likely that by the time the aircraft reaches the production stage more powerful versions of the Avon will be available which will result in improved figures. With the present engines, the aircraft has a maximum take off weight of 99,200 lbs. and at this weight requires a runway length of about 7,000 feet. Cruising speed is 415 knots.

The principal features of the Caravelle's structure are:

• **The wing** has a torsion box spar, with integral fuel tanks, consisting of three webs and a stiffened thick skin; this makes an exceptionally stiff structure, both in torsion and bending.

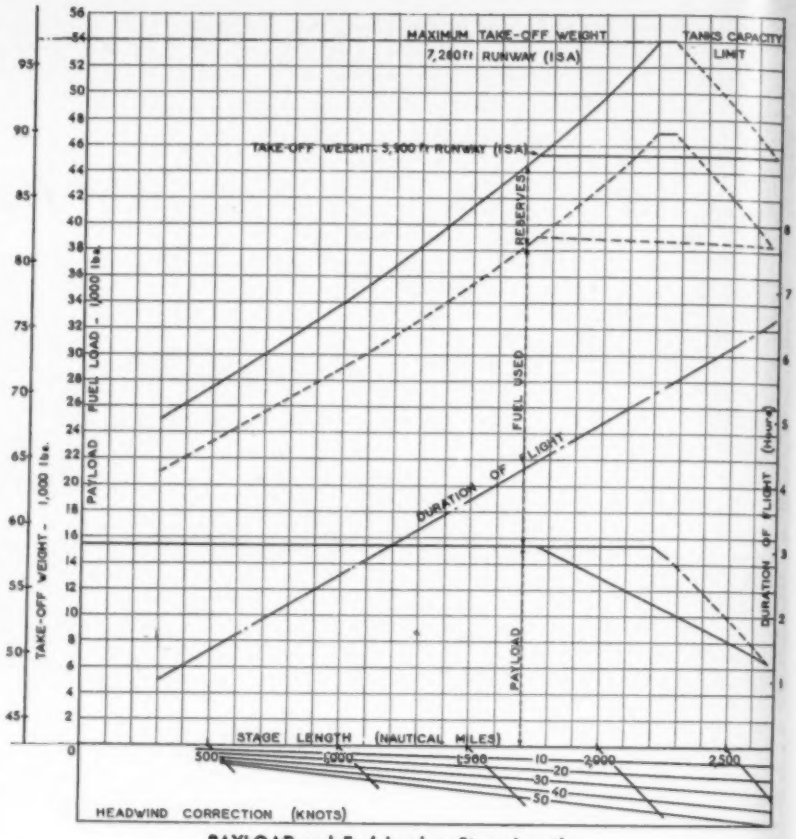
• **A semi-monocoque** pressurized fuselage with closely-spaced formers and longitudinal stringers. The rear part is specially designed to allow the installation of different engines with a considerable range of thrust and weight.

• **Large skin panels** and special extruded light-alloy sections of very high strength are used.

• **The pressure joint** between wing and fuselage is designed to allow the removal and replacement of either mainplane—there is no center section, the wing being joined on the centerline.

• **A fully-stressed** load bearing cabin floor in the cargo-version.

Flight instruments are arranged so that two crew members only are required to control the aircraft. Pilot and co-pilot have exceptionally well-equipped instrument flying panel. The co-pilot is in charge of radio communications, engine controls and the ancillary services. A third seat allows the carrying of an extra crew member who can reach all the controls of the ancillary services.



PAYLOAD and Fuel Load vs Stage Length.
(70 Passengers Version)

There are two main hydraulic systems, each incorporating two engine-driven pumps, one on each engine, supplying simultaneously two independent sets of servo controls. In reserve there is a third system, powered by an electric pump, which can supply either of the main servo-control circuits. One of the main systems also supplies the other hydraulic circuits (undercarriage, flaps, air brakes). The emergency circuit for landing gear, flaps and brakes is fed by both an electric and a hand pump. The electrical power supply gives a considerable margin of safety, since either generator or engine failure is automatically corrected.

Fuel is entirely stored in the integral wing tanks, the engines being fed through eight booster pumps. The supply to each engine is independent. In case of an engine failure the remaining engine can be supplied with all the fuel through a cross-feed system. Pressurization and de-icing are provided by air bled from the engines. • • •

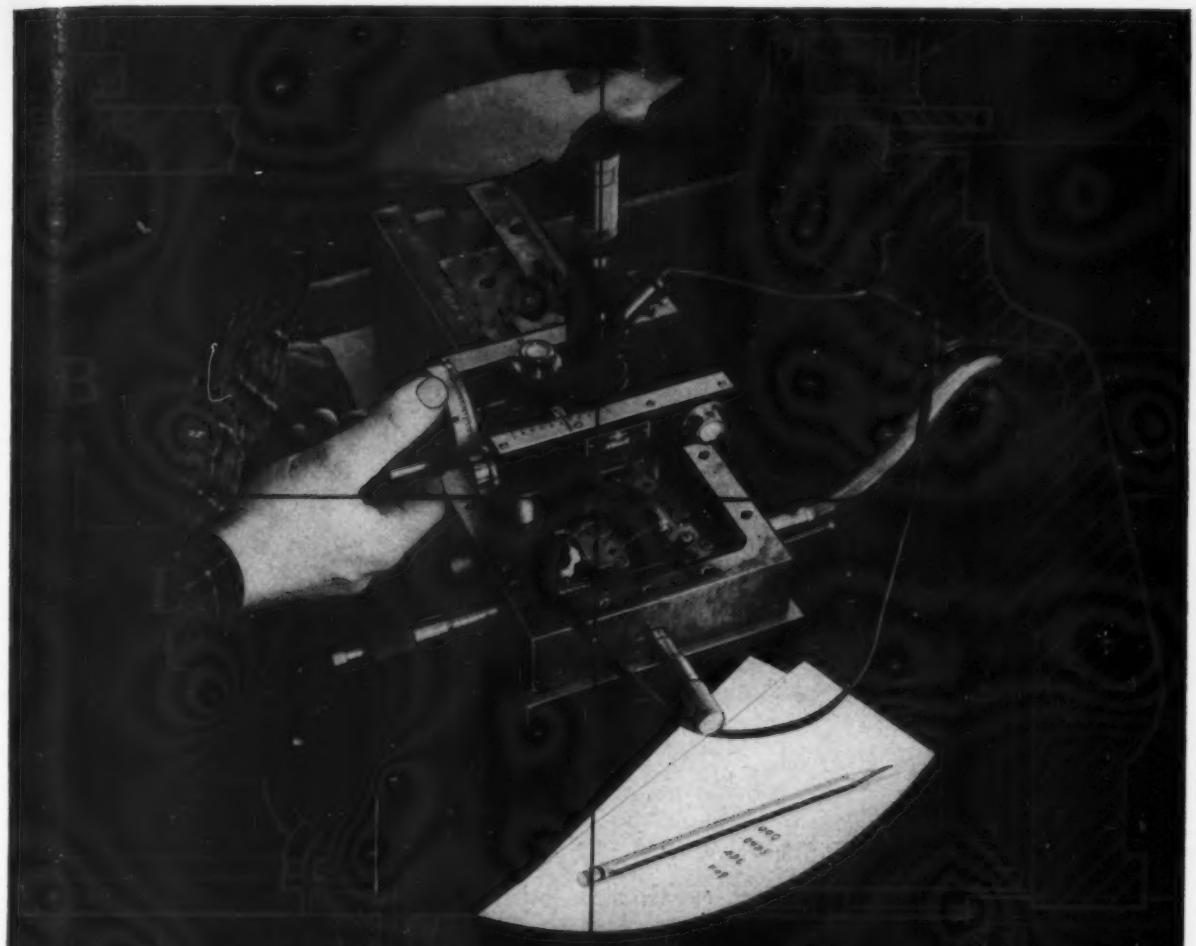
CARAVELLE's main gear was made by Hispano-Suiza which also holds the license to build the aircraft's Rolls-Royce Avon powerplant.

Britannias to Start Service Next April

British Overseas Airways Corp. plans to put its first turboprop Bristol Britannias in service on the London-Johannesburg route in April, according to the company's general sales manager, J. R. Stainton.

The BOAC executive said the company would not introduce Britannia service on any other routes until the African service has been organized.

The British company plans mixed service on the turboprops to Johannesburg: 24 first-class and 48 tourist-class passengers. The new planes will carry bigger cabin staffs and meals and drinks of wider variety than present service will be offered, Stainton said.



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Anti-Trust Suit Snarls Balboa Case

Government action against Panagra seen as key to Latin American interchanges

The government's 17-months' old anti-trust suit against Pan American-Grace Airways last week appeared to hold the key to new interchanges that must be worked out between New York and Latin America by five airlines under a ruling by the Civil Aeronautics Board.

The Board gave the airlines—Pan American, Panagra, National, Eastern and Braniff—a 60-day period, expiring June 20, to come up with voluntary agreements under which one interchange would be operated by Pan American, Panagra and National, and another by Eastern and Braniff. In issuing this order, the Board rejected an agreement that would have linked PanAm, Panagra and Eastern.

Early this month, Braniff charged that no agreements called for by CAB would materialize until Pan American had exhausted its efforts to have the government shelve or drop the Panagra anti-trust suit. Braniff complained that PanAm was trying to swing a deal with the government under which PAA would carry out CAB's decision by interchanging with National if the Justice Department would call off its dynamite-laden anti-trust suit.

• **Braniff's charges,** voiced by Washington attorney Hubert A. Schneider, drew an official "no comment" from the Justice Department. PanAm officials were noncommittal.

The anti-trust suit was filed by Justice in January, 1954, and is aimed at dissolving the 50-50 ownership held in Panagra by PanAm and W. R. Grace and Co.

Procedurally, the suit was brought by Justice after a rather complicated exchange of correspondence initiated by CAB years ago. Should the case now be shelved it would presumably require concurrence of the Board.

Reports at presstime were that Justice, outspoken in support of its anti-trust action in the past, was now agreeable to sitting down and at least listening to new developments in the case.

The anti-trust suit by its nature involves monopoly features the Government has felt it must prosecute. Gist of arguments against continuing the suit reportedly is that the new interchange alignment ordered by CAB would minimize or eliminate grounds for the suit.

• **CAB's decision** in the so-called New York-Balboa Case was issued April 20. It gave the parties 60 days to work out voluntary agreements. That decision served notice that if no voluntary deals are worked out, the Board might (1) issue an order compelling an Eastern-Braniff agreement and (2) refuse to renew the trackage agreement which is Panagra's only entry to the U.S. mainland if PanAm, Panagra, and National can't get together.

Schneider told AMERICAN AVIATION that Braniff has been ready "all along" to interchange with Eastern. But, he said, "until PAA indicates a willingness to interchange with National, I don't expect Eastern to indicate a willingness to interchange with Braniff."

National Airlines' senior vice-president Alexander G. Hardy said his company is ready and willing to negotiate an interchange with PanAm and Panagra.

Eastern was the only carrier to petition for reconsideration of the original CAB decision and did not appear to close the door to working out a deal with Braniff, eventually. The Eastern petition was denied promptly by CAB.

The situation, therefore, seems to turn on which way the government goes on the reported PAA offer in connection with the anti-trust suit.

• (1) If the government decides not to shelve the anti-trust action, PanAm and/or Eastern might test the CAB interchange decision in the courts.

• (2) Or, these carriers might decide to drop the fight and work out the interchanges with National and Braniff.

• (3) Or, the government may feel the interchanges end the need for anti-trust action, and the interchange agreements would presumably fall in line.

In any event, the case, which politically has been a hot potato for two Presidents, has lost none of its dynamite despite the CAB's April 20 decision, which seemingly had written its finale.

• • •

TTA May Get First Feeder Certificate

Trans-Texas Airways appears first in line for a permanent local service airline certificate under procedures adopted by Civil Aeronautics Board for implementing new legislation guaranteeing permanency to all local lines.

Board proposes to handle each line's case in the order in which the carrier's existing temporary certificates expire. TTA and Southwest Airways had completed renewal cases and are slated for early action.

Remainder of the local industry, subsequent to the filing of permanency applications, will be issued show cause orders setting out the intermediate points which CAB feels should be permanent and those which should be temporary. All terminals, under the new law, will be permanent.

As a guide to determining the status of intermediates, a minimum of 50% of which must be made permanent, CAB will apply a standard of five enplaned passengers per day. Any less than that standard on the average presumably will mean a temporary status for the point involved.

However, the great majority of present points exceed the standard in traffic production. Out of 267 intermediates for which traffic figures were available for the past year, 174 qualify for permanency. In all, the local industry is certificated to serve 387 points, including terminals and suspended intermediates.

The CAB proceedings in connection with permanency applications will be streamlined. They will be limited to the issues of (1) a permanent certificate and (2) the status of intermediates. Any complications with respect to intermediates and any route adjustments for the carriers will be tried in subsequent proceedings.

Since the Trans-Texas and Southwest renewal cases dealt with route adjustments, etc., those carriers will be exceptions to the rule, because CAB expects to issue simultaneously with their permanent certificates a decision on the route adjustment phases of the renewal proceedings. A prehearing conference on TTA's permanency application was scheduled this month.

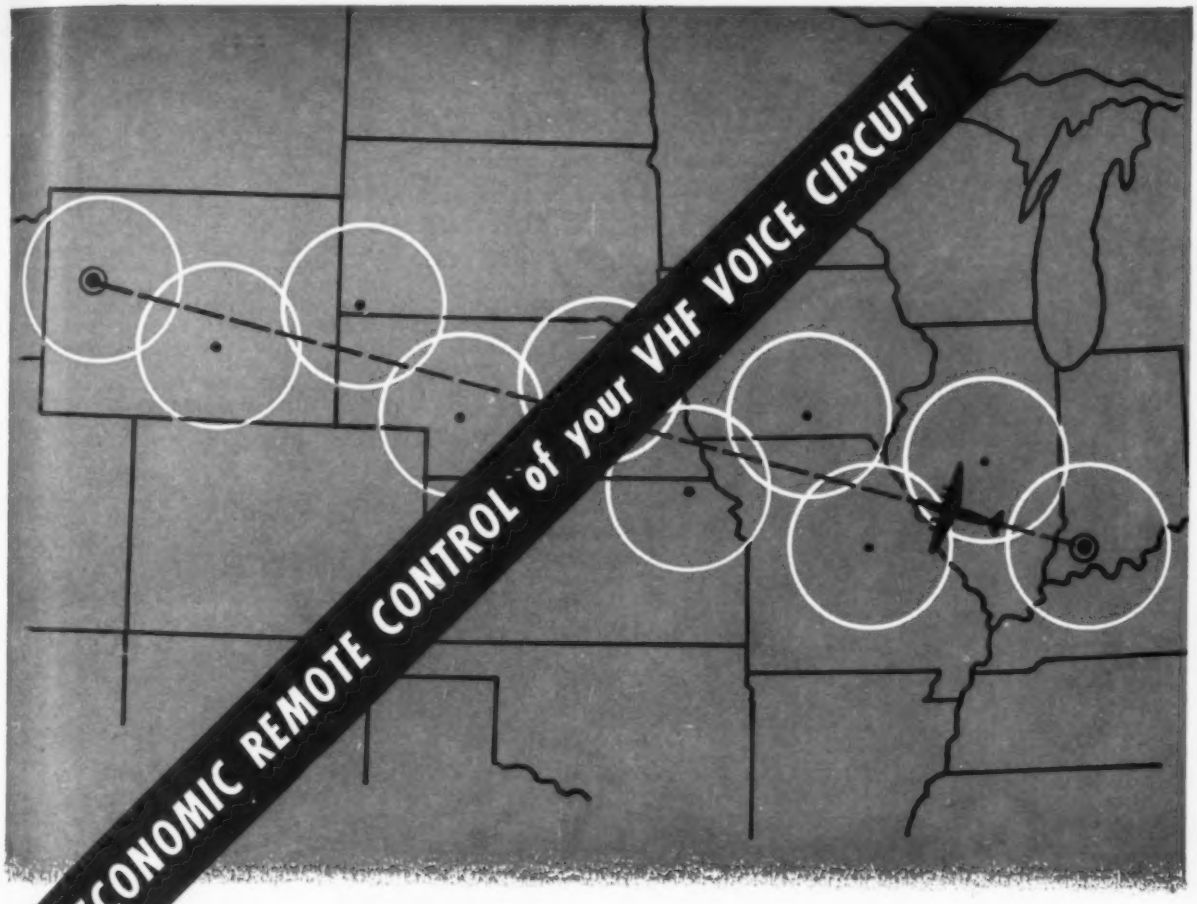
Trunk Airlines Win Permanent Mail Rate

The domestic trunk airline industry, which has been on temporary service mail rates for 14 months, was returned to a permanent rate status with the establishment this month by Civil Aeronautics Board of a new multi-element rate structure.

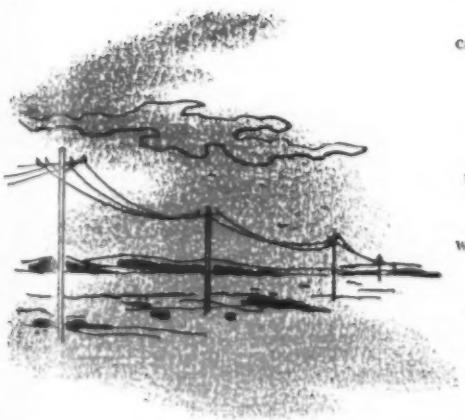
The new rates, agreed to by the industry and Post Office previously, were first advanced by CAB last month in a show cause order. No objections were filed and on June 7 CAB issued an order putting the rates into effect.

Actually, from April 1, 1954 through August 31, 1955, industry service will be figured on specific ton-mile rates. Beginning September 1, the multi-element structure will take effect, with the industry receiving so much for the line-haul carriage of mail and so much per pound enplaned at terminals.

The new rates mean an approximate $5.3 million cut in the trunks' annual service mail pay.



by *Collins* RC-101 SYSTEM



Pilots and attendants at outlying fields over a wide geographic area can now economically maintain direct contact with a central control point. Noise-free VHF communication, limited to line-of-sight may be extended over any expanse of land without cost of additional operators. All functions of two transmitters and two receivers at up to twelve remote unattended sites may be connected to a central operating position by four wire toll telephone circuits, or microwave. Transmitters and receivers are selected by telephone dial operation. Push-to-talk control of any one or all transmitters is provided. Complete remote control results in greater speed and reliability in handling vital communication, together with a reduction in overall operating expense.

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Airlines Report Top Executives Salaries

The following carriers have filed with CAB Schedule E reports listing the 1954 salaries, other compensation, and stockholdings of officers and directors:

● **Central Airlines, Inc.**—Keith Kahle, pres. and dir., $12,000 salary, $25 bonus and indirect compensation; F. E. Howe, exec. v.p., treas. and dir., $12,000 salary (up $2,000), $25 bonus and indir.; Luther Hudson, secy., no salary, no bonus and indir.; Alicia H. Pritchett, asst. secy., $4,292.50 salary (up $657.50), no bonus and indir.; John L. Blackwell, v.p. operations, $9,600 salary (entered office May 14, 1954), no bonus and indir.

● **Colonial Airlines, Inc.**—Branch T. Dykes, pres. and dir., $28,933 salary (up $1,333), $2,849 bonus and indirect compensation; Thomas J. Dunnion, v.p., $17,533 salary (up $1,333), $1,260 bonus and indir.; James E. Reinke, v.p., traffic and sales, $13,053 salary (includes salary before election as officer), $494 bonus and indir.; Norman D. MacDonald, treas., $11,333 salary (up $1,333), $383 bonus and indir.; Thomas A. Campo, asst. treas., $8,167 salary (up $667), $259 bonus and indir.; L. Orville Cameron, v.p. and secy., $17,333 salary (up $1,333), $785 bonus and indir.; Daniel S. Dunn, asst. secy., $7,267 salary (up $853), no bonus and indir.; Robert H. Herrnstein, v.p. traffic (term expired 1953), $583 severance pay; Carl W. Rach, v.p. operations, $18,753 salary (includes salary before election as officer), $1,284 bonus and indir.; John J. Murphy, chrm. exec. committee and dir., $11,000 salary (up $2,000), $595 bonus and indir.

● **Eastern Air Lines, Inc.**—E. V. Rickenbacker, chrm. of bd., gen. mgr. and dir., $50,000 salary, $14,009.32 bonus and indirect compensation; T. F. Armstrong, pres. and dir., $35,000 salary (up $7,500), $5,420.97 bonus and indir.; P. H. Brattain, first v.p., $32,500 salary (up $1,500), $7,366.79 bonus and indir.; S. L. Shannon, second v.p. and dir., $30,000 salary (up $1,500), $5,161.48 bonus and indir.; L. P. Arnold, v.p., $22,500 salary, $3,812.66 bonus and indir.; J. H. Brock, v.p., $20,000 salary (up $1,500), $2,574.81 bonus and indir.; M. M. Frost, v.p., $27,500 salary (up $1,500), $3,268.57 bonus and indir.; C. Froesch, v.p., $15,000 salary (up $1,800), $2,630.43 bonus and indir.; W. Van Dusen, v.p., $20,000 salary, $1,903.22 bonus and indir.; R. Ramspeck, v.p., $20,000 salary (up $2,500), no bonus and indir.; W. L. Morrisette, v.p., $7,579.12 salary (entered office May 24, 1954), $1,104.59 bonus and indir.; F. L. Farley, secy., $15,000 salary (up $1,800), $1,524.90 bonus and indir.; T. E. Creighton, treas. and dir., $17,500 salary (up $4,500), $2,061.40 bonus and indir.; J. C. Warlick, asst. secy., $4,387.50 salary (entered office May 24, 1954), $707.82 bonus and indir., J. K. Kilcarr, asst. treas., $4,875 salary (entered office May 24, 1954), $507.50 bonus and indir.; W. Blackwood, controller, $8,750 salary (down $6,250) (resigned April, 1954), no bonus and indir.

● **Ellis Air Lines**—R. E. Ellis, pres., $14,400 salary; G. A. Bodding, v.p. operations, $13,200 salary; N. T. Gerde, secy. and treas., $12,300 salary; W. A. Nabel, dir., $10,800 salary; J. L. Sherman, v.p. maintenance, $12,300 salary.

● **Frontier Airlines, Inc.**—L. E. Leverone, chrm. of bd. and dir., no salary (entered office April 13, 1954); H. S. Darr, chrm. exec. committee and dir., $7,000 salary (down $17,000) (entered office Nov. 10, 1954); C. A. Myhre, pres. and dir., $14,770 salary (up $2,362); J. D. Lindsay, v.p. traffic and sales, $8,950 salary (up $1,300); E. N. Levin, secy. and dir., no salary; L. P. Blatter, treas., $8,468 salary (up $818); Irene Moltzau, asst. secy., $3,780 salary (up $300); E. W. Sexton, Jr., asst. treas., $6,150 salary (up $525).

● **Hawaiian Airlines, Limited**—S. C. Kennedy, pres. and dir., $24,525 salary (down $4,175), $300 bonus and indirect compensation; Ford Studebaker, exec. v.p. and dir. (elected dir. Jan. 1, 1954), $17,500 salary, $300 bonus and indir.; David Watson, v.p., controller and dir. (elected dir. Aug. 26, 1954), $15,500 salary (up $125), $180 bonus and indir.; John S. Pugh, secy., $10,500 salary (up $105), no bonus and indir.; Brian Cooke, treas. (elected treas. Aug. 26, 1954, formerly asst. treas.), $9,933 salary (up $433), no bonus and indir.; George K. Tanabe, asst. treas., $8,000 salary (entered office Aug. 26, 1954), no bonus and indir.

● **Helicopter Air Service, Inc.**—T. H. Reidy, pres., treas. and dir., $12,000 salary, $4,000 bonus and indirect compensation; C. W. Moore, v.p., $9,600 salary, $3,000 bonus and indir.; C. E. Cessna, secy. and dir., $3,600 salary, no bonus and indir.; R. B. Kiel, asst. secy. and asst. treas., $7,200 salary, no bonus and indir.

● **Lake Central Airlines, Inc.**—Harry V. Wade, trustee, no salary, $2,800 bonus and indirect compensation; R. B. Stewart, pres. and dir., $5,200 salary, no bonus and indir.; William H. Kreig, secy. and dir., no salary, $1,400 bonus and indir.; Cecil A. Berry, dir., no salary, $650 bonus and indir.; J. Dwight Peterson, dir., no salary, $700 bonus and indir.; L. W. Hartman, v.p. and treas., $10,169 salary (up $611), no bonus and indir.; R. W. Clifford, v.p. operations, $11,549 salary (up $549), no bonus and indir.; D. S. Getchell, v.p. traffic, $8,450 salary (up $350), no bonus and indir.; J. L. Cory, asst. treas., $7,110 salary (up $219), no bonus and indir.

● **Los Angeles Airways, Inc.**—C. M. Belinn, pres. and dir., $18,000 salary; $4,500 bonus and indirect compensation; John T. Kane, treas. and dir., $7,720 salary (up $700), $1,000 bonus and indir.; Martin J. Burke, secy. and dir., no salary, no bonus and indir.; Donald L. Litton, asst. secy., $4,137.50 salary (up $425), no bonus and indir.

● **Mohawk Airlines, Inc.**—E. V. Underwood, chm. of bd., no salary; Robert E. Peach, pres. and dir., $16,250 salary (up $1,250); John R. Carver, v.p. and secy., $11,749.92 salary (up $749.92); Carl A. Benscoter, v.p. operations, $14,333.21 salary (up $833.21); W. D. Bosworth, treas., $7,458.31 salary (up $458.31); W. J. Fields, asst. treas., no salary; H. Stuart Goldsmith, asst. treas., $6,240 salary (up $440); Lois P. Hornbrook, asst. secy., $3,870 salary (up $315); L. N. Simmons, dir. and general counsel, $3,600 salary.

● **National Airlines, Inc.**—G. T. Baker, pres. and dir., $30,000 salary, $32,128 bonus and indirect compensation; R. E. Wieland, regional v.p. New York, $12,000 salary, $13,066 bonus and indir.; A. G. Hardy, v.p., $12,000 salary (up $9,000), $10,994 bonus and indir.; John L. Morris, v.p., $12,000 salary, $13,051 bonus and indir.; C. F. Sharp, v.p. customer relations, $12,000 salary (up $1,000), $13,051 bonus and indir.; J. M. Rosenthal, v.p. industrial relations, $12,000 salary, $13,051 bonus and indir.; C. H. Calhoun, v.p. maintenance, $10,000 salary (down $2,000) (term expired September 30, 1954), $13,051 bonus and indir.; C. E. Banks, v.p. production, $6,000 salary (entered office July, 1954), $1,760 bonus and indir.; J. C. Brawner, treas. and dir., $12,000 salary, $13,051 bonus and indir.; R. P. Foreman, secy. and dir., $12,000 salary, $13,051 bonus and indir.; W. F. Johnston, asst. treas. and asst. secy., $11,000 salary, $11,964 bonus and indir.

● **New York Airways, Inc.**—Robert L. Cummings, Jr., pres. and dir., $18,275 salary (down $50); Horace Brock, v.p., $2,000 salary (entered office Nov. 1, 1954); William W. Hogan, treas., $9,500 salary (up $1,000); Marshall Skadden, secy., no salary; Glen B. Eastburn, asst. to pres. and asst. treas., $9,000 salary; John L. Senior, Jr., chrm. of bd. of dir., $150 salary (down $400) (resigned April 5, 1954).

● **North Central Airlines, Inc.**—H. N. Carr, pres. and dir., $13,885 salary (up $13,585) (entered office April 7, 1954), $75 bonus and indirect compensation; F. N. Buttomer, v.p. traffic and sales, $9,904 salary (up $685) (entered office April 7, 1954), no bonus and indir.; A. E. Schwandt, v.p. industrial relations, $9,904 salary (up $181) (entered office April 7, 1954), no bonus and indir.; B. Sweet, secy. and treas., $6,197 salary (up $167) (entered office April 7, 1954), no bonus and indir.

CAB NEWS

Pending Cases

Another in the growing list of new route cases is one involving service in the **Washington-Chicago** area. It stems from a long-standing Eastern Air Lines' application and full scope will not be determinable at least until a prehearing conference scheduled later this month.

CAB's decision in the **Transatlantic Cargo Case**, favoring a temporary all-cargo certificate for Seaboard & Western Air Lines has been awaiting Presidential signature more than a year. It was originally submitted May 19, 1954. It has been held up most of that time by the Commerce Department but should be sprung loose in the near future.

Only other CAB case at the White House at presstime was the **Trans-Pacific Airlines Renewal Case** in which CAB has recommended renewal of the Hawaiian carrier. Early action by the President is likely.

Board Chairman Ross Rizley is not promising when cases will be decided but he is promising CAB will start procedural steps on applications much prompter than in the past. Hence, many old applications, such as EAL's above in the Washington-Chicago case will be put in motion during the summer.

Calendar

June 21—Hearing, Eastern Air Lines Route Consolidation Case. Wash., D. C., Docket 3292 et al.

June 27—Hearing, Reopened Transatlantic Final Mail Rate Case. Tentative. Docket 1706 et al.

June 30—Prehearing conference, Washington-Chicago Case (Eastern Air Lines). Wash., D. C. Docket 2396.

July 7—Argument, Large Irregular Air Carrier Investigation. Wash. D. C. Docket 5132 et al.

July 12—Hearing, 3c Mail-by-Air Rate Investigation. Tentative. Docket 6881.

July 26—Hearing, Eastern-Colonial Merger Case. Wash., D. C.

Recent Decisions

Bonanza Air Lines' temporary mail pay increased to $1,017,167 from $829,680, to reflect increased volume of operations.

Aerovias Sud Americana, granted exemption to transport property between Cozumel, Mexico, and other points on its certificated cargo route.

Allegheny Airlines authorized to operate summer nonstop flights between Pittsburgh and Atlantic City.

New Applications

Eastern Air Lines has asked for expedited hearings on its May 27, 1954, application for a New York-Nassau route.

National Airlines has asked CAB to reverse its dismissal of charges against Eastern Air Lines concerning "prior control" of Colonial Airlines.

Ozark Air Lines applied for new routes segments between (1) Joplin and Tulsa, (2) Rockford, Dubuque, Rochester, and Twin Cities, and (3) Davenport-Moline, Cedar Rapids, Rochester, and Twin Cities.

Inaugurating the New Super-7 Clipper Service

PAN AM MAKES 50,000TH TRANS-ATLANTIC CROSSING

with Sperry Gyropilot

Flying with Pan American World Airways is nothing new for Sperry! On November 22, 1935, Sperry Gyropilots* helped Pan Am blaze the way for the first Pacific crossing on the "China Clipper."* And from the beginning of its trans-Atlantic service in 1939, Sperry Gyropilots have been standard equipment.

Now, 150,000,000 miles and 50,000 trans-Atlantic crossings later, Pan Am again chooses Sperry Gyropilots for the luxurious new Super-7 Clippers.*

Incorporating many new refinements for increased accuracy, simplicity and dependability, the Sperry automatic pilot of 1955 gives the pilot more precise control of his aircraft than ever before. Used alone, or in connection with the new Sperry Radio Beam Coupler, the Sperry Gyropilot, besides giving the pilot a dependable, trustworthy assistant, gives the passenger a smoother, more comfortable ride and the airline operator greater efficiency and economy.

*T. M. REG. U. S. PAT. OFF.

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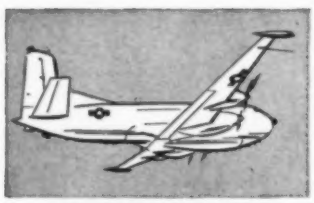
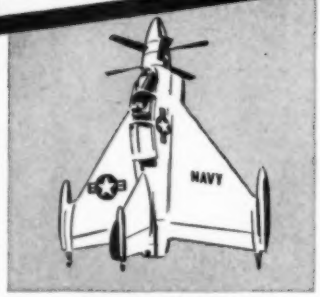
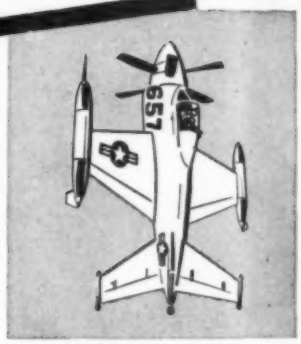


DOUGLAS YC-124B
long-range transport
for the U.S. Air Force

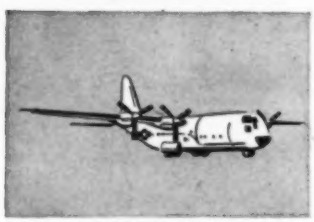


CONVAIR XFY-1
vertical take-off fighter
for the U.S. Navy



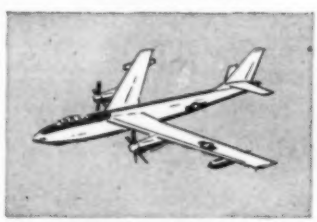
LOCKHEED XFV-1
vertical take-off fighter
for the U.S. Navy

BOEING KC-97J
USAF long-range
tanker transport



REPUBLIC XF-84H
USAF experimental Turbo-
prop fighter type aircraft

LOCKHEED YC-130
USAF high-performance
air freighter



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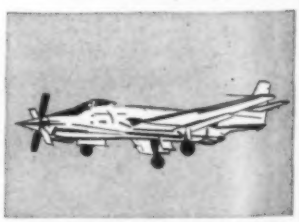
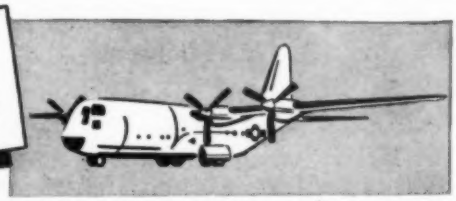
long-range bomber
for the U.S. Air Force



McDONNELL XF-88B
USAF experimental Turbo-
prop fighter type aircraft

Delivered in Quantity for
PRODUCTION INSTALLATION



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CURTISS-WRIGHT
CORPORATION • WOOD-RIDGE, N. J.

By Eric Bramley

Chances are that you'll see a decided shift in emphasis in the promotion of transatlantic air travel this fall. The difference between on-season and off-season fares has now been narrowed and the "big savings" theme is no longer as effective. The upcoming off-season family plan will get the big play. And we salute Pan American World Airways for getting its foot in the door early.

* *

PAA has issued a booklet—five months in advance of the off-season—aimed at the woman of the family, calling attention to the new plan. "And think about it *now*—before you make vacation plans for this summer," PAA says. "Fall is the best time to go to Europe. Things are less 'touristy'—and you get a better vacation value all around." PAA evidently believes that old saying about the early bird.

* *

What's the smallest stop on a scheduled airline? North Central Airlines says it's Land O' Lakes, Wis., with 150 permanent residents. It's in the center of the resort country and summer tourist population reaches 50,000 (NOR's service is on a seasonal basis). Anyone care to nominate a smaller stop?

* *

With a multitude of fly-now-pay-later plans being offered, we once jokingly wondered why some airline didn't reverse the procedure and introduce a pay-now-fly-later scheme. Our Eastern Air Lines friends now tell us that the company has such a plan in connection with its Happy Holidays package vacation program. If you want to lay away 20 bucks toward your future vacation, take it to EAL and they'll give you an exchange order for it. Deposit another 20 and receive an exchange order for $40, etc.

* *

Odds and ends: Large railroads lost a cool $668.7 million from passenger and allied services in 1954 . . . Airlines have been waiting many months to learn if Travelfares is still active. Word now comes that the Seattle outfit, which plans to attach coupons to grocery store merchandise and make them exchangeable for travel will get under way shortly . . . Meanwhile, Travel Tabs Inc., Albany, N. Y., is offering trading stamps to merchants (5,000 for $25). Customers can redeem 1,800 of them for $6.75 in travel or $6 in merchandise . . .

Sales, Traffic, Promotion

Last year, when domestic airlines, through the Air Traffic Conference, decided to drop the proposal to cut travel agents' commissions (from 5% to $1.50 one-way and $3 round-trip) on domestic business, it was recommended that an airline-agency committee be named to handle problems that might arise in the future. The carriers have now appointed their representatives to this important group (all traffic and sales vice presidents): Charles Speers, American; Ray Ireland, United; Rex Brack, Braniff, and Dave Miller, Allegheny. As far as is known, agents have not yet named their representatives . . .

One of the most eye-catching direct-mail pieces in months is Northwest Airlines' folder on its Stratocruiser food service. Featured is a large full-color picture of a steak dinner and all the trimmings . . . Delta-C&S has issued a new folder to business firms describing its holiday travel incentive plan. Company is also distributing pencil cups plugging its DC-7 service . . .

A first-come first-served air freight reservations service has been introduced by American Airlines on its non-stop DC-7 flights New York-Los Angeles and Washington-Los Angeles. The service (no extra cost) permits shipments leaving the east in the morning to arrive in Los Angeles the same afternoon . . .

Allegheny Airlines has put its newly acquired Martin "Executives" into service on Pittsburgh-Atlantic City, New York-Pittsburgh and Pittsburgh-Huntington, W. Va., segments . . . Mohawk Airlines plans to place its three Convair 240s in service about July 1 . . . Southern Airways has appointed Day, Harris, Hower and Weinstein Inc., of Atlanta, as its advertising agency . . .

Pan American World Airways has revised and improved tourist meal service on the New York-Bermuda route and is carrying three cabin attendants per flight. A shrimp cocktail has been added to the meal, and the new tourist entrees are now served on first-class trays. Plastic utensils have been replaced by silverware. One cabin attendant takes care of the salable beverage service, the second prepares the food, the third serves the meals and takes care of the passengers (IATA regulations do not restrict the number of attendants that can be carried, but airlines are not permitted to advertise how many are aboard each flight) . . .

The "Flight Topper," which American Airlines claims is the "most unusual innovation in stewardess apparel in years," is now being worn by AA's gals while they serve meals or beverages on non-stop DC-7 transcontinental flights. It's a full-length cotton-silk dark blue garment worn over the traditional uniform (with jacket removed). Designed by Nieman-Marcus of Dallas for use by its own models . . .

TWA has lowered the minimum age for hostesses from 21 to 20 and will accept girls with only two years (instead of three) of college, business experience or nurses' training. Other requirements remain unchanged . . . TWA says more than 4,000,000 people viewed the 23 different films in its free-loan film program through various group showings last year, while 387 million more saw them on television. This year TWA has combined several films for the convenience of organizations that wish to make up a longer program . . .

NEW "CARRY-ALL," designed for fast ramp handling of baggage, has been placed in service by United Air Lines at Newark, Philadelphia, Cleveland, Chicago, Seattle, Los Angeles and San Francisco. It's a converted Kaiser-Willys Jeep with wheel base extended 15 inches and accommodates an enlarged truck bed designed to carry 2,000 lbs. Removable sides permit easy fork-lift loading. It also carries mail, express and freight and is used as a tow truck for cargo carts. Vehicle was developed jointly by UAL and R. W. Allen Co., San Carlos, Calif.

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Agency—Fuller & Smith & Ross, Inc.

BLS Aviation Notes

The Bureau of Labor Statistics reported the following aircraft and airline labor negotiations, agreements and adjustments during February and March:

METALWORKING

● **Douglas Aircraft** and UAW-CIO negotiated 5- to 7¢ hourly wage increases for 17,500 employes in Long Beach, Calif., Tucson, Ariz., and for 6,500 employes in Tulsa, Okla., plus certain job classifications and changes in health and welfare provisions.

● **Chance Vought Aircraft** and UAW-CIO, Electrical Workers (IBEW-AFL), and Lithographers-CIO negotiated wage increases of 3% for 7,000 production workers, liberalized holiday provisions, and increased third shift differentials for powerhouse operators. A similar salary increase was put into effect for 4,900 non-union salaried employes.

● **Bell Aircraft** gave about 1,000 non-union salaried employes in Fort Worth an increase of 2.5%, plus an additional 2.7% increase effective March, 1956. Sick leave and severance pay plans were liberalized and premium pay was provided certain salaried employes for overtime work. The existing cost-of-living allowance was incorporated into base rates.

● **Lockheed Aircraft Service, Inc.**, in Burbank and Ontario, Calif., and IAM-AFL negotiated wage increases of 3%, made inequity adjustments, liberalized holiday pay and group insurance clauses.

● **Sperry Gyroscope Div.**, Sperry Corp. and 2,250 members of independent engineers and draftsmen negotiated a 2.5% deferred wage increase.

● **Bendix Radio Div.**, Bendix Aviation Corp., reduced wages 1¢ hourly of 3,500 IAM-AFL workers, Baltimore, as part of automatic cost-of-living adjustment.

● **Solar Aircraft Co.** and 1,600 IAM-AFL workers negotiated wage increases of 6- to 8¢ hourly, which included additional 2¢ hourly to tool liaison workers, three, instead of two, days sick leave to employes with 10 years continuous service, and holidays paid in addition to vacation pay for any six paid holidays falling during vacation period.

● **Pacific Airmotive Corp.**, and 1,100 IAM-AFL modification and repair employes at Burbank and Chino, Calif., received 3% wage increases averaging 7¢ hourly, joint administration of hospital and surgical insurance, shift and odd work week bonuses applied to holiday and sick pay, 15% maximum field-duty bonus, and escalator clause discontinued with current 1¢ allowance incorporated in base rates.

● **Rheem Manufacturing Co.** and 1,600 IAM-AFL employes of aircraft division, Downey, Calif., negotiated 5- to 7¢ hourly wage increases, made additional inequity adjustments of 5-29¢ hourly, and discontinued escalator clause with 2¢ allowance incorporated into base rates, and 3.62% wage "package."

● **Rohr Aircraft Co.** and 1,600 IAM-AFL employes at Riverside, Calif., negotiated a 3.5% wage increase, with joint administration of group insurance plan and improved surgical benefits.

TRANSPORTATION

● **Capital, National, Northwest, Trans World** and **United Air Lines** and IAM-AFL settled dispute with 14,000 ground service workers, negotiating revised 18-month agreements granting 5- to 7¢ hourly wage increases retroactive to July, 1954, and additional increases to standardize mechanics rates at all five lines, effective in 1955. The agreement shortens time required to reach maximum rates in certain instances, and made wage progressions automatic over a two-year period for mechanics employed by NWA, TWA and UAL, where progression had been contingent on trade tests.

● **American Airlines** and UTW-CIO concluded new contract whereby approximately 6,000 maintenance and ground service employes received wage increases of 5- to 8¢ hourly, revised work rules, and shortened (37½-hr.) week for the midnight shift.

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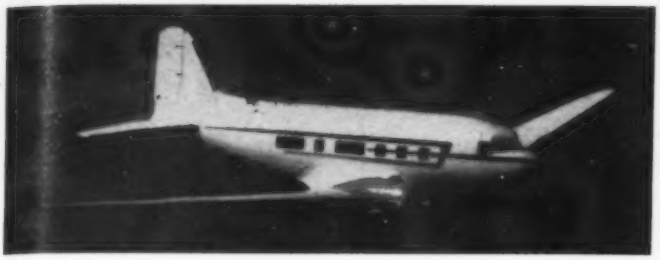

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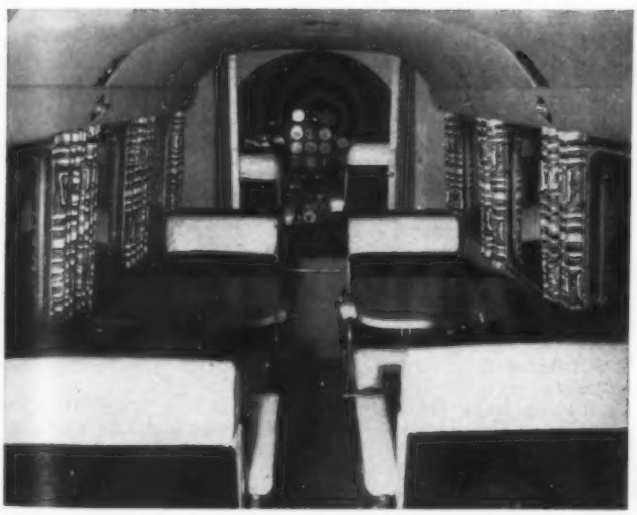

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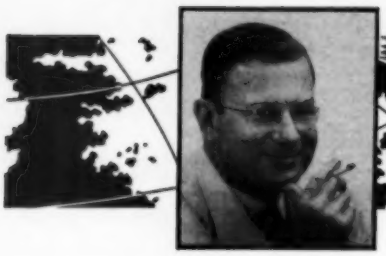


EN ROUTE . . .

WAYNE W. PARRISH

The Disgrace of Airliner Washrooms

Bob Adams, the advertising man (Delta-C&S, Curtiss-Wright, etc.), was flying from Copenhagen to Rome a few weeks ago and apparently had made a visit to what serves as the gents room on the plane (a Douglas) because he decided to write me a letter which everybody in the air transportation business ought to read with care.

"In the course of my travels," he wrote, "I have done my share in the Pullmans, mostly prior to 1928. The morning crowd of drummers in the washroom always had its code and after shaving and whatnot, the well-traveled man always mopped up his mess and left things reasonably neat for the next guy.

"Now why is it that in this advanced age of travel with every refinement of bathroom fixtures aloft, except bidets and showers, man has to revert to such primitive behavior in attending to natural functions. The most modern and attractive W. C. that Douglas can design is reduced to a shambles in a two-hour trip by the average passenger list.

"As an expert in matters of plumbing I suggest that you initiate a campaign for Better Bathroom Manners Aloft—or how to leave the lavatory as though you might be the next to use it.

"I think part of the blame may be laid at the manufacturers' door in that they do not provide sufficiently obvious and convenient receptacles for disposal of every sort of trash. I think it was in a BEA Viscount that I saw a kitchen-type waste bin whose lid flipped up with a toe-treadle. It just invited action! Providing separate **convenient** repositories for towels and paper refuse ought to save a lot of messy separation later.

Restroom Artists Next?

"It's nothing short of amazing how people who can lay out $500 for transatlantic travel or who are going to Miami to spend $100 a day can have the habits of animals in the privacy of the cubicle.

"I'm afraid that if we don't start a campaign now, the next thing will be that walls of the public rooms will begin to attract the would-be-artists and poets who have decorated some of our best comfort stations on the ground."

Amen! The subject is worthy of a whale of a lot more attention by the manufacturers, for one thing, and by the airlines for another. On the side of the aircraft builders, they haven't been too practical in laying out lavatories, in my opinion. For long-distance airplanes, urinals in the men's room should be an essential—as in the Boeing Stratocruiser—but the trend seems to be against separate rooms for the two sexes on transcontinental planes.

My wife has often expressed shock at the way the lavatories become shambles in a short time and the fact that stewardesses seem to consider it beneath their station in life to do anything about cleaning up the places. I might add that my wife has always put BOAC on a pedestal among all the airlines for its washrooms, although I I must confess that even on BOAC stratocruisers the men passengers mess up the place faster than the stewards can keep it clean.

A Deep-rooted Problem

The problem is serious enough to get attention from top management. Certainly there is nothing to prevent the airlines from putting up some signs asking for cooperation in frank terms. And there are always a few airlines that don't send their planes out with spic-and-span washrooms to start with.

Maybe the problem is deep-rooted in passenger psychology. Art Kelly, Western's v.p.-traffic and sales, enlightened me one night in Los Angeles by pointing out that air passengers, even those who frequently go by air, are unconsciously tense when they reach an airport to take a plane. He attributes the frequency of short tempers at airport counters to this underlying tenseness.

Could it be that the primitive behavior of passengers in airline lavatories has its base in this same psychological tenseness which affects people at boarding time? Or could it be that people generally have become so completely disrespectful of somebody else's property that they don't give a damn? Bob Adams was right about the Pullmans. But isn't behavior about as bad in public places and in department stores, etc., as on the airlines? Or is it? Whatever the answer, the lavatory in an airplane after two hours in flight is an absolute disgrace. On an overnight flight over the Atlantic it's even worse.

Four More Airports

Just knocked off four more new airports. Seems that Erle Cocke, Jr., v.p. of Delta-C&S was getting married out in Chicago May 28 so I went out to participate in the gala occasion. On a Capital DC-4 I went via Flint and Saginaw/Midland/Bay City, Michigan, both new stops.

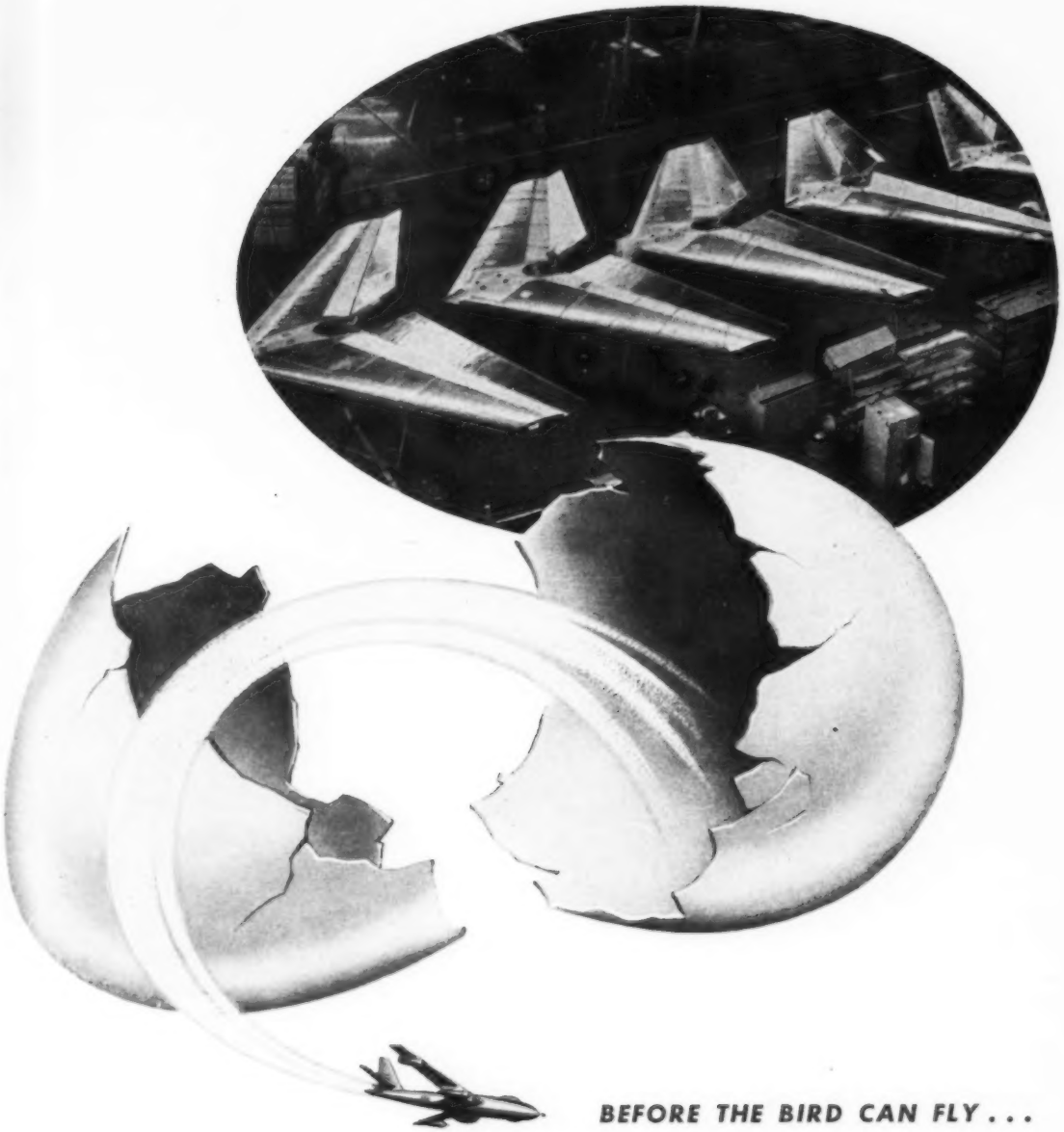
At Cleveland I was glad to see the new handsome, modern terminal making real progress; should be open before too long. At Flint I came across an old friend, Clyde Cole, one of the best airport managers in the country, who proudly showed me the new terminal and outlined coming improvements such as high-intensity lights and a bigger ramp.

I returned to Washington by the longest route on record—nine hours and nine stops. First was a Delta DC-7 to Cincinnati, where I was met by H. Baker Slater, dsm for Piedmont Airlines, who put me on #52 for the Tri-City Airport at Bristol, Va. Had a fine flight with Capt. John Onuff and Purser Bill Mathews, and hit a new stop—London/Corbin, Kentucky.

At Bristol, had lunch with Don Edmondson, dsm, and Bill Clark, station mgr., and hopped on Piedmont's #86 for Richmond, Va. Had some nice chats with Capt. Ed Thurber—like all Piedmont pilots, a real booster for the company—and 1st Officer Acree and Purser Mike Woods. Hit another new stop, Bluefield/Princeton, W. Va., saw some very beautiful country, and connected with an American Convair for Washington.

Caracas Noise

Recently on this page I took occasion to comment about the terrific noise in most restaurants in Caracas, Venezuela and made specific reference to a pleasantly-situated spot called Mi Vaca y Yo (My Cow and I). I said the music was so loud that conversation was impossible. Dick Gluski, who represents Delta-C&S down there, reports that he showed the comments to the restaurant management and it is going to eliminate the loudspeakers. This will go a long way to improving the situation, so when you're in Caracas pay a call on Mi Vaca y Yo. Thanks, management, and give my regards to the cow as she wanders through the restaurant.



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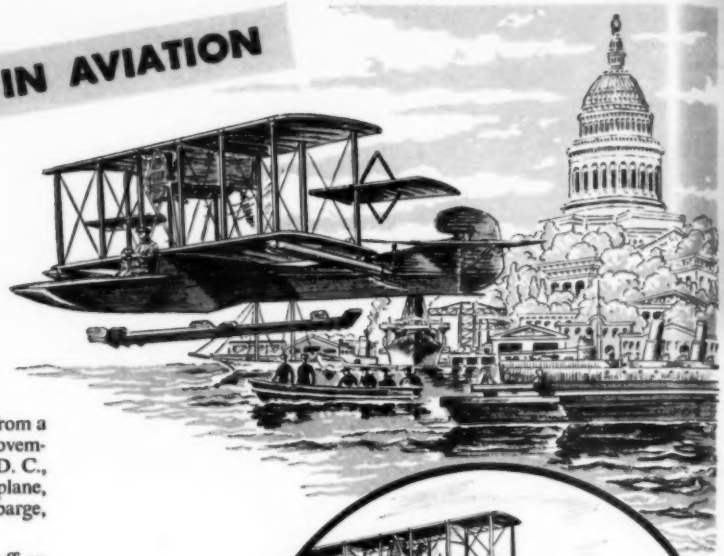
PRESENTS

MILESTONES IN AVIATION

Full Steam Ahead



That the catapult method of launching aircraft from a ship could be practical was demonstrated on November 12, 1912, in the Navy Yard at Washington, D. C., when a blast of compressed air propelled a plane, carried on a cradle, along a track laid on a barge, and into the air.

In November of 1915, a Curtiss *F-boat* took off on the first successful catapult launching from a battleship deck. In 1916, the catapult launching device was made standard equipment of the Atlantic Fleet. Since then, catapult-launched aircraft have proved themselves invaluable to our Navy.

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